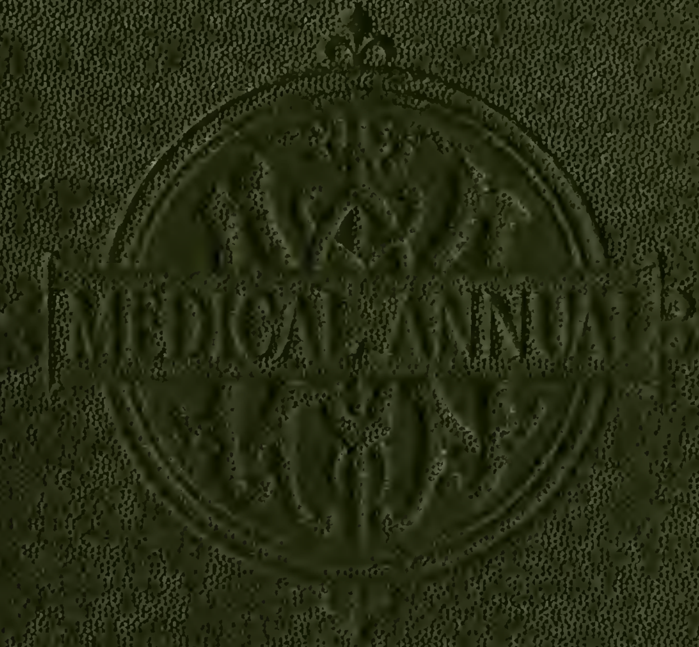

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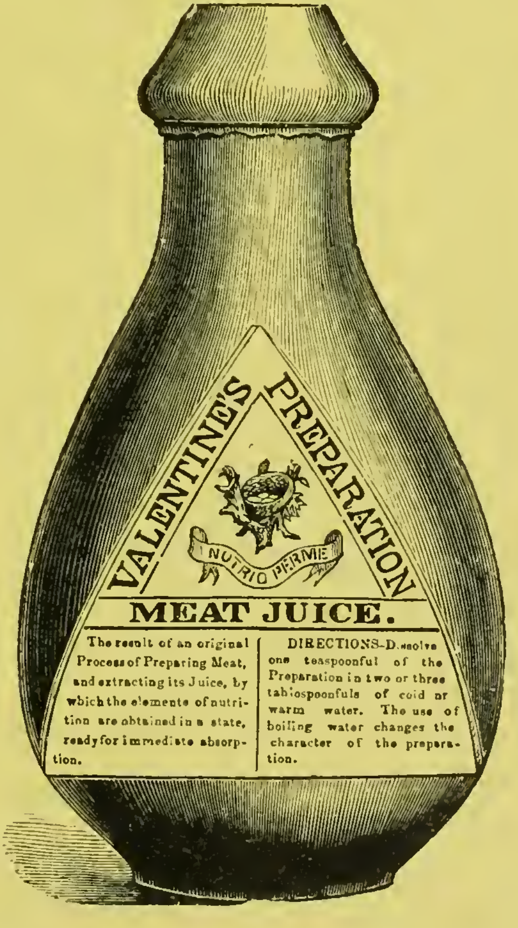

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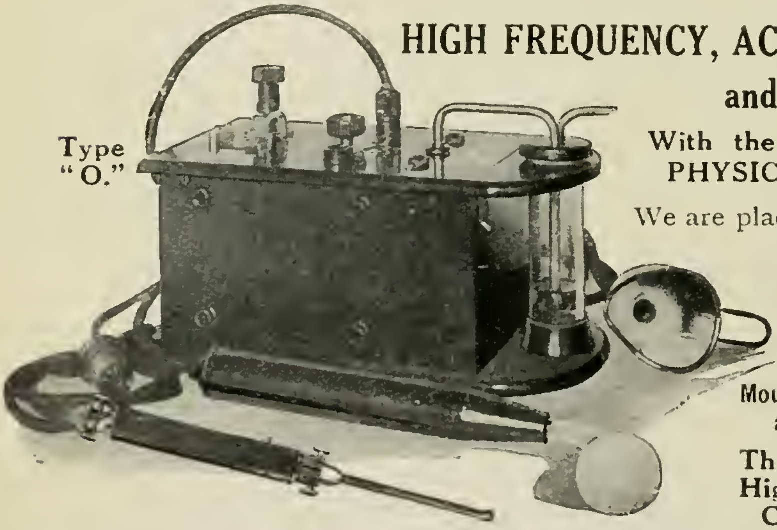

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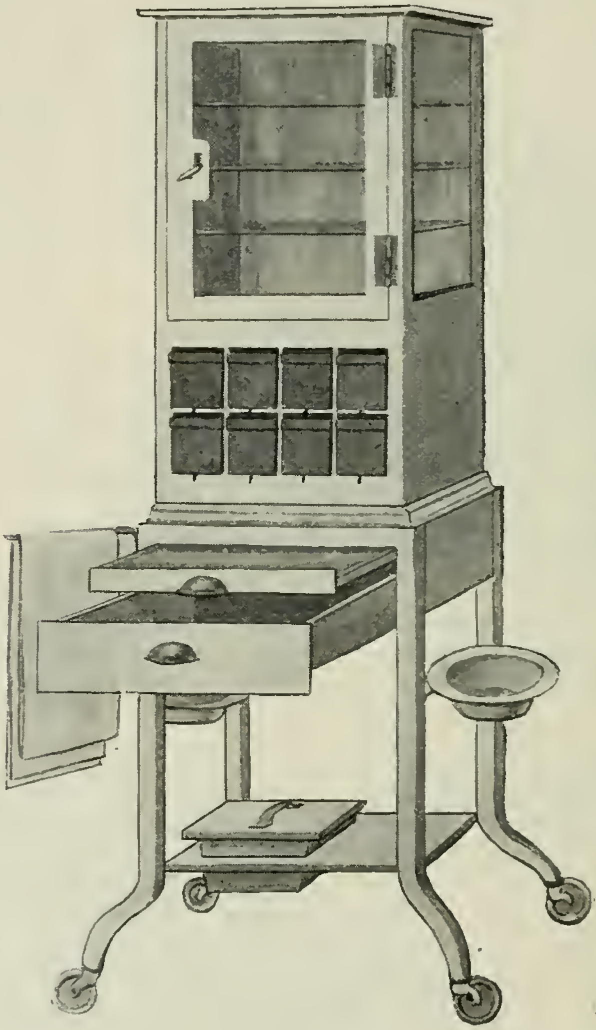

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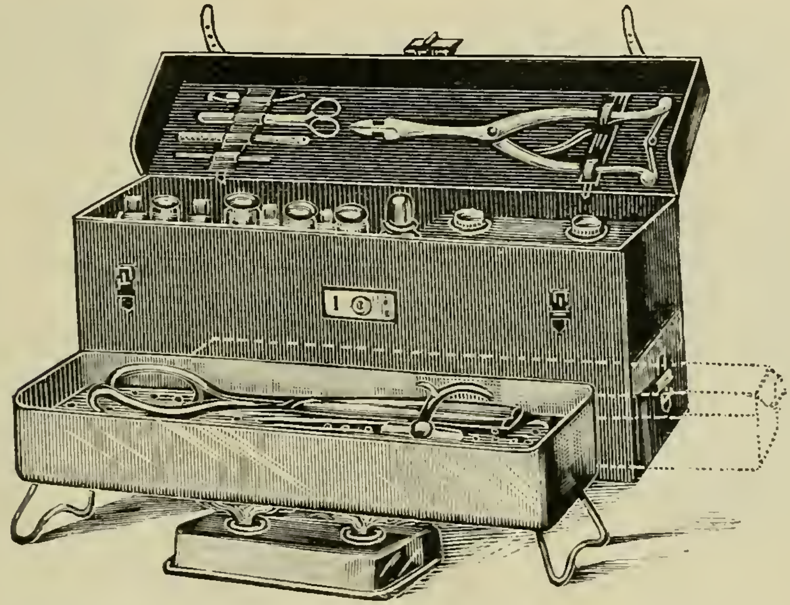

The bag is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

The Sterilizer has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion of the bag being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

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PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush, Minim Measure in case, Chloroform Drop Bottle in case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

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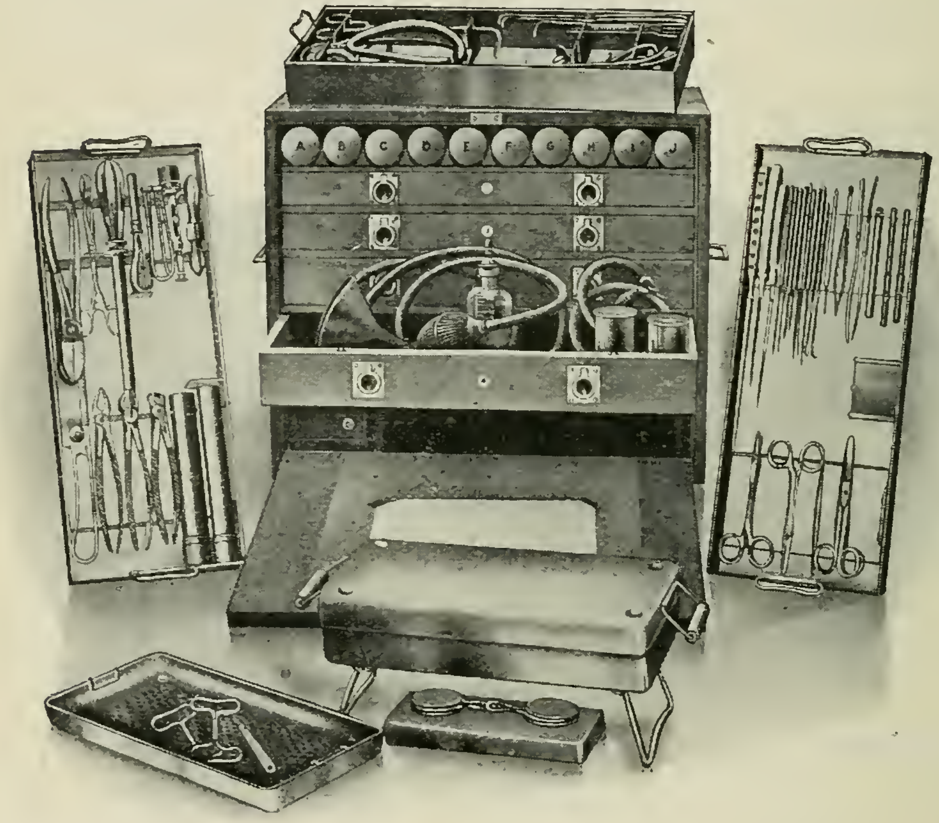

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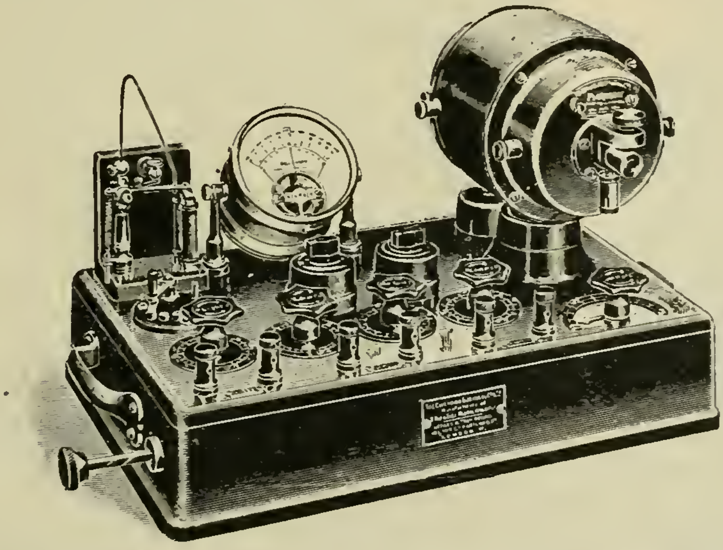

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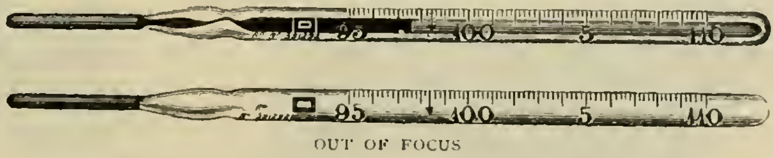

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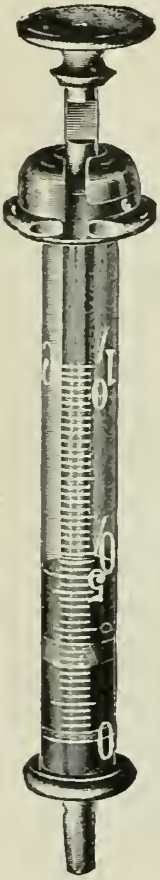

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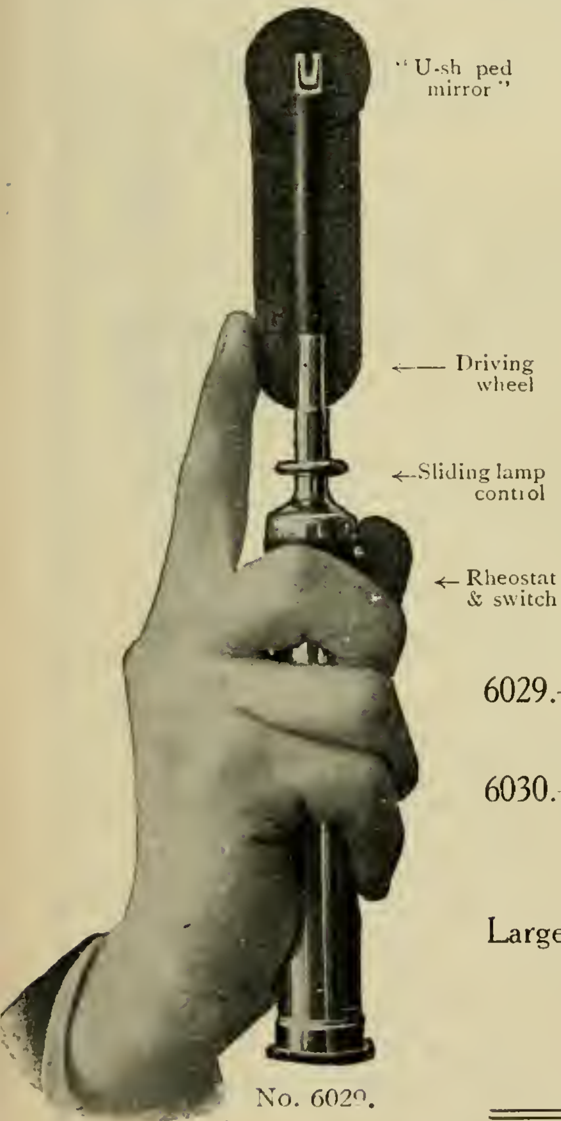

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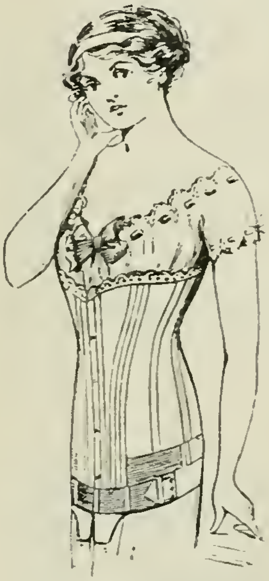
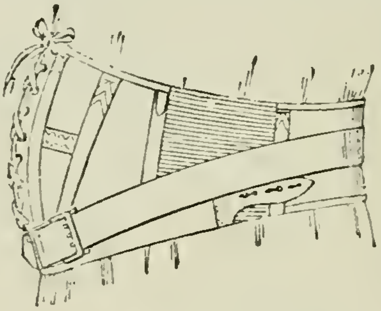


BELT-CORSET.
Medium Bust.



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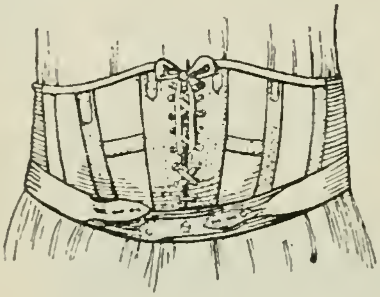

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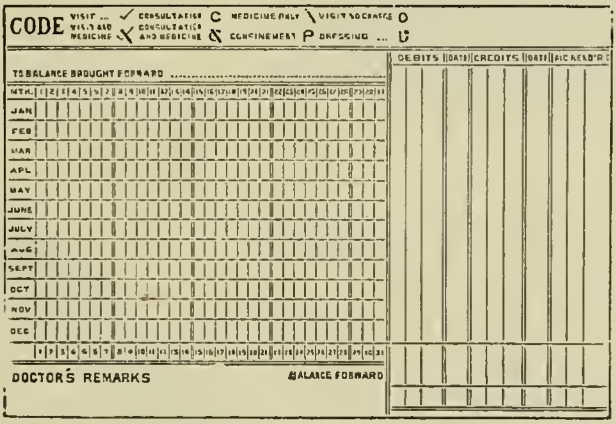

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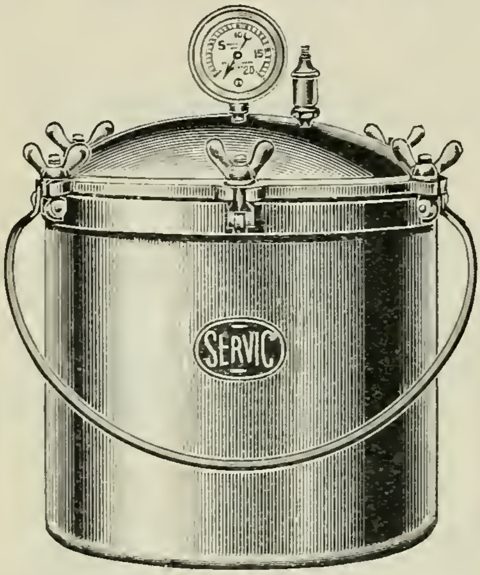

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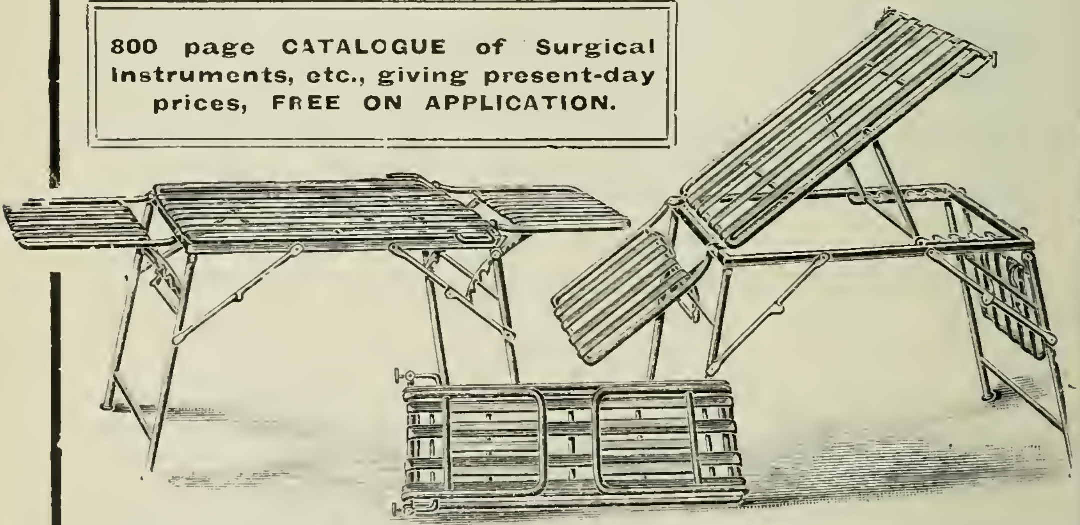

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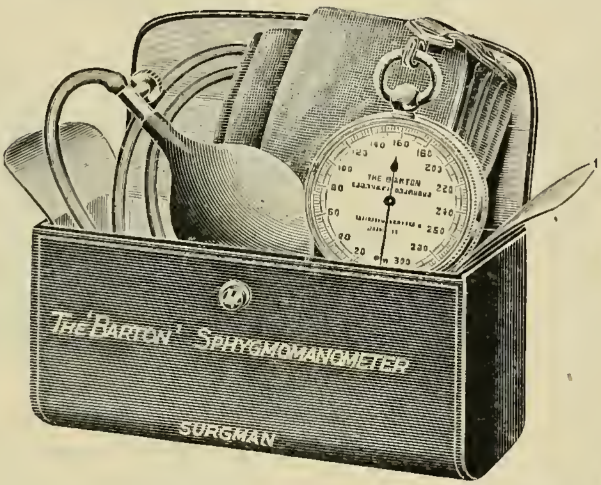

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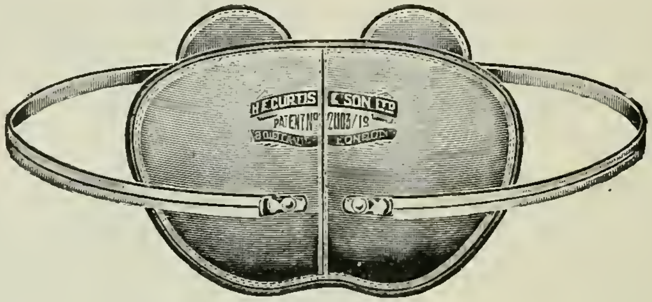

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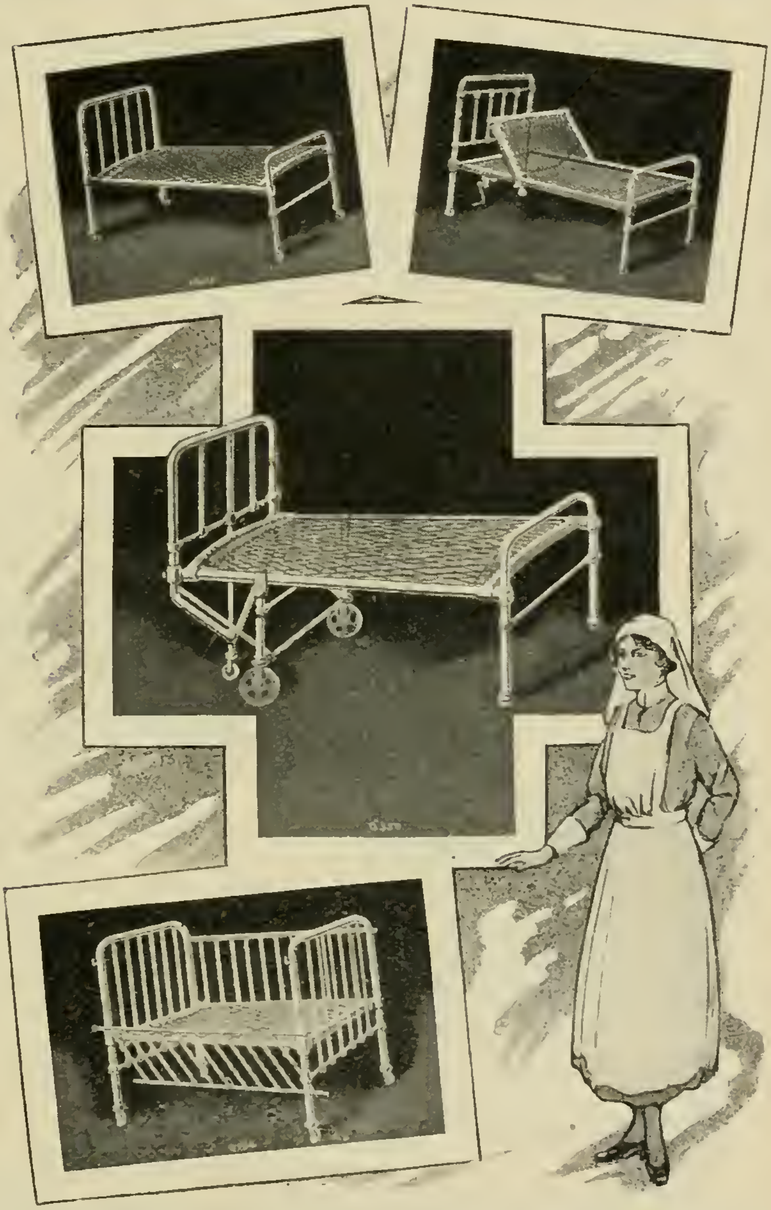

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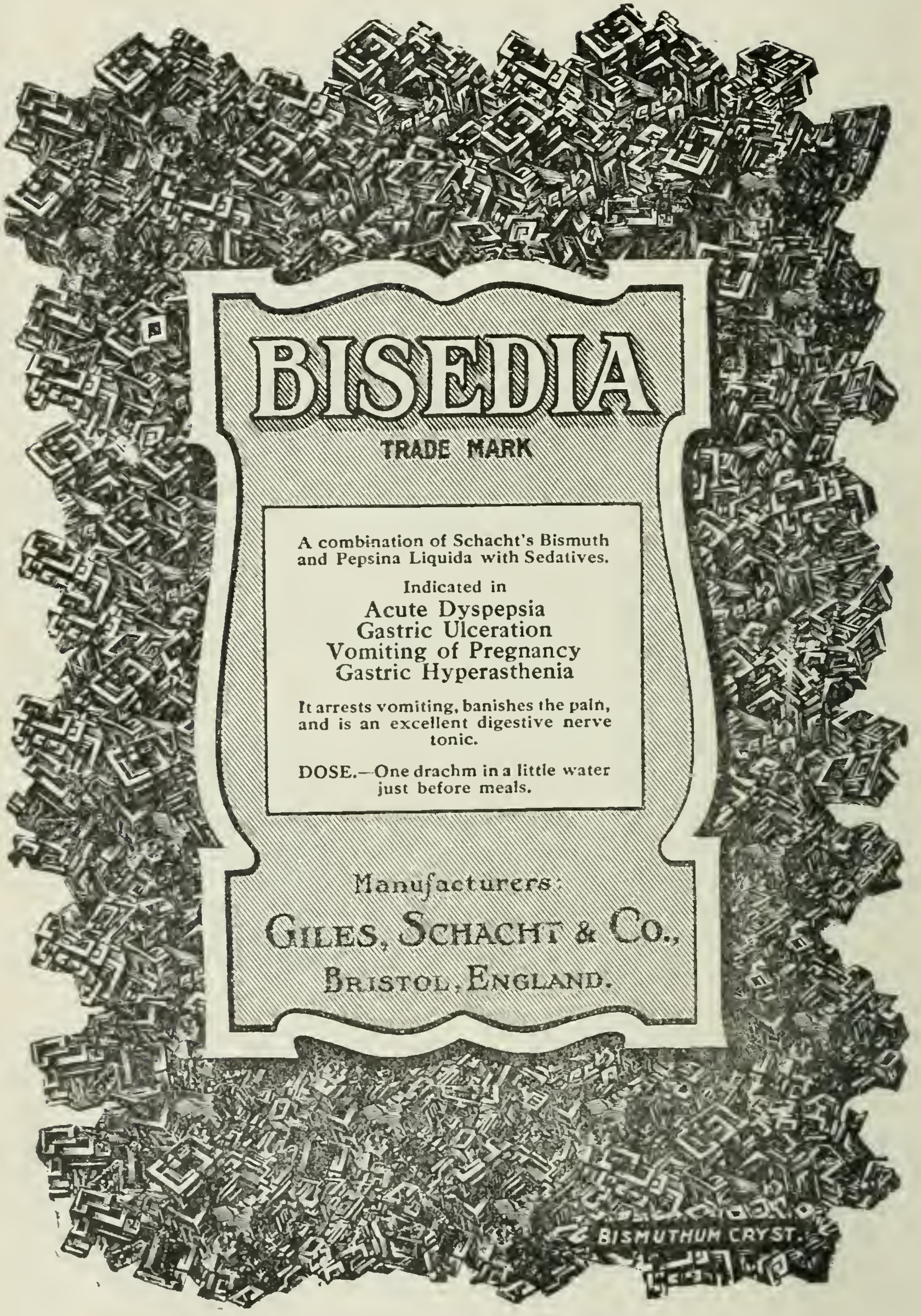
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# *Preface.*

This issue, the forty-first yearly edition of the Medical Annual, is arranged on the lines of last year's volume which have met with the general approval we ventured to anticipate.

It will be found to contain an exceptional number of practical and suggestive articles, and our Contributors have succeeded in imparting to many of these a personal and critical note which may be helpful to the reader in estimating the value of the new views presented.

To all who have helped us in the production of this volume we heartily acknowledge our indebtedness.

THE EDITOR.

*The Medical Annual Offices,*
*Bristol, England, March,* 1923.

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# THE MEDICAL ANNUAL, 1923

## *A Review of the Year's Work in the Treatment of Disease.*

## INTRODUCTION

### BY THE EDITOR.

While going through the proofs of the present volume, we have been struck by the large number of articles it contains of practical clinical value. For some years the work in the laboratory has tended to overshadow that of the clinician, and mechanical methods of diagnosis have been regarded as more important than personal examination, both physical and symptomological. We have now reached a stage when we realize that clinical diagnosis must come first, and then we can seek every possible aid that the laboratory can afford to support or correct our reasoned opinion.

The ideal thing, of course, is 'team work', which is so much practised in America. Sir W. I. de C. Wheeler strongly advocates this method in his article *Surgical Treatment, General.* He explains that team work means that all concerned in the case—the pathologist, the clinician, and the surgeon—must work in *personal* contact. "Consultations, as we know them, have no connection with the modern conception of team work as applied to a surgical case. Sending portions of pickled meat to a laboratory at a distance, and placing reliance on the report received—the surgeon never seeing the pathologist and the pathologist never seeing the patient—is an insult to modern thought". The paper contains so much that is practical and suggestive respecting the treatment of the patient before, during, and after the operation that we would strongly advise all our readers to peruse it. He quotes the written instructions which are given to the sisters of his wards, to be followed in all operation cases, and we think that these might find a useful place in many hospitals. He is opposed to the high temperature of the operating theatre favoured by many surgeons. He asks us to depart from some routine methods, but he always has a sound and well-thought-out reason for doing so.

Mr. Thurstan Holland, in his article on *Radiotherapy*, gives some valuable suggestions respecting the choice of *x*-ray methods. There is at present a demand for 'deep therapy', as a result of the methods carried out at Erlangen; but it should not be forgotten that the older method of repeated small dosage has its advantages in many cases, especially in most skin conditions, exophthalmic goitre, leukæmia, and superficial tuberculous glands. Ward, in an account of the Erlangen technique, says that this method of carcinoma therapy is one in which the $x$-ray dose is so near being a dangerous one, that unless the radiologist has an intimate knowledge of the apparatus, the technique, and the principles upon which the method is based, harm rather than good may result. There is danger of delayed reaction taking place some time after the treatment. Attention is directed to the value of $x$-ray therapy in exophthalmic goitre, and some excellent clinical advice is given as to the selection of cases and the method of administration. The author lays stress on the early treatment of such cases instead of using $x$ rays as a last resource. Another valuable field for the employment of $x$ rays has been found in the treatment of diphtheria carriers, the bacilli disappearing in a very short time. The rays have proved a reliable help to the diagnosis of tuberculosis of the lung, and we are able to give a series of plates which should be of interest to our readers.

In an address on otitis media, Sharpe states that for chronic otorrhœa, limited to the tympanic cavity, no method gives results comparable with zinc ionization. It is not unusual, he says, to see the ear of an adult which has suppurated continuously from childhood, cease to do so after a single application. (*Electrotherapeutics.*)

Our knowledge of the surgery of *Bones and Joints* is brought up to date by Mr. E. W. Hey Groves in his lucid and well-illustrated article on this subject. He mentions that in the treatment of tuberculous disease of bones, joints, and glands the mercury quartz lamp has been used with success to take the place of heliotherapy. He also deals very fully with congenital dislocation of the hip. There has been considerable discussion on this subject in America ; but from the careful examination of cases made by Goldthwaite and Adams it appears that the results in children under six years of age are generally good ; over that age they are far from satisfactory. The author discusses the treatment of adults with unreduced dislocations, and offers some suggestions. The modern method of treating fractures is also well explained in the article.

The section on heart disease this year has been kindly undertaken by several distinguished French physicians with the co-operation of Dr. Carey Coombs. This has enabled us to include some recent investigations which will play an important part in the study of heart affections. Phonometry is very little known in this country, and we are fortunate in having one of the inventors of the method to explain it to us. It enables us to understand the phenomena of high tension and the results it may have under varied conditions (*Arterial Tension, High*). In this article the value of a salt-free diet in reducing tension appears to be very generally admitted. It is a curious fact that the deprivation of salt leads to rapid loss of weight, and that loss of weight from any cause appears to diminish arterial tension. The subject of *Bradycardia* is dealt with by the same authors in a monograph which carries us far beyond our previous knowledge of the subject, and which will be read with great interest. We would also strongly recommend our readers to study the articles *Digitalis* and *Quinidine* by the same authors, as they contain clinical suggestions of considerable importance. In the article on *Varicose Veins*, the treatment by injection is described. The authors are not very sure of its safety ; neither are they of the results of surgical treatment.

The surgery of *Aneurysm* forms the subject of a very complete and instructive article by Sir W. I. de C. Wheeler. It also deals with arteriovenous aneurysm, in regard to which the author gives us the advantage of his personal experience. Another article which every practitioner should read is *Breast, Surgery of*, by the same author. It gives us very clear indications as to the importance of the various symptoms presented when a patient asks us to say whether she is suffering from cancer, and also guides us in our opinion as to the necessity of operation. It includes also a valuable contribution by Sir G. Lenthal Cheatle on the condition he describes as the 'proemial breast'. Most of us have met with the class of cases he describes, and have perhaps hesitated in giving an opinion in respect to operative interference. Cheatle regards them with great suspicion, and advocates surgical measures. He describes the operation he performs in such cases. Some very instructive information is also given in reference to the prognosis in breast cases subsequent to operation.

One of the small emergencies of everyday practice is hæmorrhage after extraction of teeth. A piece of gauze soaked in turpentine, and pressed into the cavity, is advised by Mr. Steadman as unfailing (*Hæmorrhage*).

A pain and swelling on the inner side of the knee-joint may cause some difficulty in diagnosis and treatment. It may be due to inflammation of the subsartorial bursa, and may be caused by the tuberosity of one tibia resting on the other during sleep. Mr. R. Davies-Colley points this out in an article on *Postural Subsartorial Bursitis*.

The cure of hyperthyroidism has been credited to each of 239 drugs, says Crile. All agree about the value of physiological rest, and, apart from this, surgery and $x$ rays alone merit consideration. But he dismisses the latter, amongst other reasons, because, if the dose is sufficient to kill all the thyroid cells, myxœdema results ; if the dose does not kill the cells, they recover, and there is a relapse. He also calls attention to the extra surgical difficulties after $x$-ray treatment. (*Thyroid Surgery.*)

In the article *Varicose Veins and Ulcers*, attention is called to the remarkable results of parathyroid gland substance, in doses of $\frac{1}{10}$ gr. given by the mouth. The ionized calcium of the serum rose rapidly to the normal figure, and improvement took place. This looks as if parathyroid gland influenced the liberation or assimilation of calcium.

Stricture of the rectum has always been regarded as a result of syphilis. Mr. Lockhart-Mummery points out that this is a mistake, and such appears to be the general opinion of rectal surgeons at the present time. Even when there is a history of syphilis it does not warrant the assumption that the syphilis is responsible for it. (*Rectum, Simple or Inflammatory Stricture of.*) *Rectal Fistula* is becoming less common. This is attributed to the fact that practitioners are more careful to open ischiorectal abscesses at an early stage, and to their more efficient treatment. In acute *Proctitis* the administration of an anæsthetic and complete stretching of the rectum are recommended. Hints on the after-treatment are also given. For operation on rectal cancer, regional or spinal anæsthesia is strongly recommended. A new method by the use of neocain is described by Mr. Lockhart-Mummery in the article *Rectum, Cancer of.*

Sir Leonard Rogers' articles on *Tropical Diseases* will impress the reader, who in his own work may rarely have to deal with such cases, with the very high standard of scientific investigation which is brought to bear upon diseases which affect those Europeans who are called upon to live in hot countries as well as the native inhabitants of places remote from ordinary civilization.

The value of emetine in *Amœbiasis* has incidentally shown that the active principle of ipecacuanha, when given in too large and repeated doses, can cause congestion of the lungs as well as the intestines. It is found in such doses to cause tonic contraction of the intestines, but some relaxation of the uterus. In *Abscess of the Liver*, the method of repeated aspirations, combined with the injection of amœba-destroying drugs, Sir Leonard Rogers claims, is more efficient than open drainage.

The prevention of *Ankylostomiasis* has been rendered easier by the discovery that the hookworm larvæ in the soil die out in six weeks, so that, with the prevention of further pollution of the soil, the worm soon loses its infectivity. The success of the treatment of *Kala-azar* by the sodium and potassium salts of antimony tartrate is now well established. Sir Leonard Rogers, in view of the results obtained by H. F. Wilson in bilharziasis, suggests that tartar emetic should be given by the rectum in kala-azar both in children and adults.

About a quarter of the population of Malaya suffer at one time or another from painful lesions of the lower extremities, especially the feet, to which the name *Yaws* has been applied. We are able to give some illustrations of the condition presented. It is commonly associated with insanitary conditions, leading to infection through an abraded surface, possibly aided by the house-fly. Salvarsan appears to have a specific effect upon this disorder. Recently A. Viswalingam has obtained excellent results by intravenous injections of novarsenobillon.

In addition to the methods used for checking *Yellow Fever*, the addition of minnows to 30,000 water receptacles reduced the number of mosquitoes to 2 per cent. Vaccination is now used as a prophylactic.

In Colonel Harrison's article on *Gonorrhœa* we find a very important truth quoted from a remark made by Sir Berkeley Moynihan: "It is very doubtful whether the 'antiseptic' action produced by the addition of a particular chemical substance to a wound is due to those properties which it possesses as a bactericide. It probably possesses other properties also, which are not strictly related to its germicidal power". This is quoted in reference to the fact that although potassium permanganate is relatively poor in antiseptic properties, it has proved in practice to be one of the most useful remedies for injection in cases of gonorrhœa. It will probably be found that many vegetable solutions or infusions which have a reputation for the healing of wounds, possess properties which give them an antiseptic effect. Amongst the various agents with acknowledged antiseptic properties it is difficult to find any which favour healthy granulation. Colonel Harrison gives a number of remedies used for injection, and makes suggestions concerning their relative usefulness. Martin Pulido is quoted as having obtained satisfactory results, in *gonorrhœal rheumatism*, by the intravenous injection of mercury perchloride 1–1000. This is similar to the line of treatment used by Percy Wilde, who aspirates the fluid from one of the distended bursæ and injects a solution of biniodide of mercury into the sac. This kills the local gonococci, which then have the effect of an autogenous vaccine. Such is the theory and, whether correct or not, the results are excellent. Several observers record cases in which aspiration was used, followed by subcutaneous injection of 10 to 20 c.c. of the aspirated fluid, and brilliant results were obtained.

In *Syphilis* much attention is given to the arsenobenzol compounds, and especially to the newer preparation neosilversalvarsan. The latter has been given intramuscularly, and is said to act then more promptly than when injected intravenously. The toxic effects of arsenobenzol compounds have formed the subject of much discussion. The principal ill effect appears to be on the liver, and both Professor MacLean and Colonel Harrison consider it advisable to give patients 50 grm. of glucose to drink half an hour before the injection. so that the liver-cells are filled with glycogen and thus reduce their affinity for the drug.

The articles on *Skin Diseases* contributed by Dr. Graham Little are very practical and instructive. Thus. under *Alopecia* we have no less than twenty valuable formulæ given for our guidance. We are also told that resorcin and beta-naphthol must never be used when the hair is white or light in colour ; white hair may be changed into a yellow or green colour ; light brown or golden hair changes more slowly into a yellowish-green or, more commonly, auburn colour. He also mentions a tradition that sexually active men become bald sooner.

In the article *Dermatitis*. eruptions caused by phenolphthalein when used as a laxative are described. and it is said that the lesions leave pigmented areas which may last for years. This point is worth remembering when prescribing what appears to be a very harmless laxative. For *dermatitis venenata*. intramuscular injections of an extract from the poison ivy (*Rhus toxicodendron*) have been found useful.

In the treatment of *Erysipelas*. chinosol is very highly spoken of, and special formulæ are given. We are specially cautioned to apply the remedy for three or four inches beyond the margin of the visible erythema. A recent treatment for *Furunculosis* is by injecting the boil with a 5 per cent solution of camphor in oil, and dressing with a phenol, ergot, and resorcin ointment, of which the formula is given. *Granuloma Venereum* has yielded rapidly to intravenous injections of tartar emetic, which appears to act as a specific. We doubt if the value of tartar emetic as a bactericidal agent is yet fully explored.

In the article *Nails, Diseases of*, the use of thyroid extract is suggested in cases where there is deformity of the nails. In the case recorded the cure resulted in a patient who gave the Wassermann reaction.

In the article *Skin Diseases, General*, there are some very interesting remarks on the bacterial theory and focal infection. Leslie Roberts considers that the common flora of the tonsils and mouth, the hæmolytic and nonhæmolytic streptococci and staphylococci, may serve a useful purpose in digestion, in much the same way that intestinal bacilli act. He points out that our food consists of foreign proteins, carbohydrates, and fats, and it is essential for the welfare of the body that these should not be allowed to pass the wall of the intestine, into the interior, without first being deprived of their toxicity. There exists in the body an organized system of defence against foreign proteins. The first line is taken by the cells of the mucosa of the stomach and higher intestines, the second line by the bacteria of the colon, and the third line by the free-moving cells of the lymphoid tissues. The remarks made on the rationale of the action of foreign proteins are worth reading.

Some very practical suggestions are given in the article *Skin Diseases, General Therapeutics of*, for the selection of hair lotions in reference to the condition of the scalp. Formulæ are given for all the more common conditions met with in daily practice, and are worth making a note of.

To discover the basal metabolism of the individual is one of the more recent methods of clinical investigation, and Dr. O. C. Gruner, in his article on *Basal Metabolism*, has given an excellent description of the apparatus required and the technique. It is a method not within the reach of the practitioner in everyday work, and we are not sure that his clinical knowledge will suffer in consequence. Basal metabolism is defined as the number of calories produced per hour for each square metre of the body surface. The method of estimation depends upon the quantity of oxygen taken in and the carbon dioxide exhaled. This appears to be accomplished by the patient breathing through the mouthpiece of an inhaler. So far as we can gather, no account is taken of the carbon dioxide excreted by the skin. If this is so, serious inaccuracies must occur. It is not only a question of the amount, but of the great variation in the amount under certain conditions.

One of the most alarming events in practice is when the heart ceases to beat during the administration of an anæsthetic. Dr. Blomfield, in *Anæsthetics*, has dealt very fully with this emergency, and the information he gives furnishes profitable reading. One very reassuring fact is that it is possible to restore contractions to a heart which has ceased to beat for five minutes or even longer. This gives some opportunity for methods of resuscitation, which are fully described. He quotes Lockhart-Mummery as saying that the most efficient way of setting up contractions is the infusion of saline solution with 1–50,000 adrenalin. Another method, suggested by Crile, is the immediate injection of adrenalin into the wall or cavity of the heart. The article also contains a description of the methods used in America of giving preliminary injections so energetically that there is hardly need for the anæsthetic at all. Without endorsing the considerable claims made for this method, Dr. Blomfield gives a very complete description of the technique, which will interest the reader and may be read in conjunction with the remarks made by Sir W. I. de Courcy Wheeler in the article *Surgery, General.*

Articles on *Mental Disease* and *Psychological Medicine*, by Dr. Stanford Read and Dr. J. A. Hadfield respectively, summarize for us the work of the past year in psychiatry. In these contributions two tendencies may be described. First, there is still a movement, which has perhaps lost some of its impetus, away from the physiogenic, and towards the psychogenic, theory of mental disease. Second, and presumably as a direct consequence of the first, a serious attempt is being made to include methods of education by which the establishment of mental disorder may be averted.

There is only one way of curing a patient with brain tumour, and that is by its complete removal. Dr. Ramsay Hunt tells us in his contribution on *Brain Surgery* that drugs, *x* rays, and radium are utterly ineffectual. He describes the methods by which the exact localization of these tumours has become possible. A point of interest to the general practitioner is the fact that intracranial pressure can be reduced by the administration of large doses of salt. The 'pressure headaches' associated with hydrocephalus can thus be relieved. Of course this treatment only applies where the intracranial pressure is due to fluid.

*Encephalitis, Epidemic*, is very fully treated in an article in which Dr. Ramsay Hunt gives us the results of his own extensive investigations. In an article on *Hiccough, Epidemic*, he shows that there is a close relationship between it and epidemic lethargic encephalitis.

In acute cases of serous meningitis, the value of lumbar puncture is unquestionable ; but there is some risk in chronic cases unless we are quite sure that no cerebral tumour is present. (*Meningitis.*)

Under the title *Nerves, Peripheral, Surgery of*, will be found a very full description of the technique of this valuable and difficult branch of surgery. One of the most important factors in obtaining final functional results is the avoidance of scar tissue, and some excellent suggestions are given on this point.

The article *Epilepsy* is chiefly concerned with the careful investigations which have been made respecting the therapeutic effects of luminal. In most cases it was found that luminal diminished the number of attacks ; but tolerance was established after about two months, and its beneficial effects ceased. It was then necessary to withdraw it very gradually, or serious results were apt to occur. On the whole the results are not encouraging, and its temporary advantage is not free from risk.

The nursing and general management of the paraplegic patient is a matter of very great importance, and the article *Paraplegia*, which gives valuable suggestions on this point, is one which may at least remind the reader of things that may be forgotten or left too much to the discretion of the nurse. Apart from the physical requirements, the mental condition requires attention. Such patients are in danger of becoming paralysed mentally as well as physically.

*Spinal Surgery* is dealt with by Dr. Ramsay Hunt with his characteristic thoroughness. The subject of section of the spinal cord to relieve pain is of great interest, and there is much that is of importance in the early recognition of spinal tumours and distinguishing their symptoms from other complaints for which they are frequently mistaken.

Much attention has been given in America to incorrect posture as a cause of many functional disorders. This is called 'faulty bodily mechanics'. Dr. Loring Swaim, of Boston, has contributed a short note on this subject, at our request, and we think it will be of interest to our readers. (*Posture Treatment.*) As he tells us, temporary bad positions do no particular harm; but when they are repeated often enough and become habitual attitudes, they cause serious interference with normal health, vitality, and endurance. The position of the patient confined to bed is a matter of great importance, and some hints given by Dr. Swaim on this point are worth the attention of those who are concerned in the management of hospitals and sanatoria. We have personally seen cases where serious injury had been done to the nerve-supply of the lower limb by the strained position into which the patient was forced during a long operation, and this would not occur if the principles of correct posture were better understood.

In Dr. Langmead's article on *Infant Feeding* we have an instance of the thoroughness of American methods. Human milk is preferable to cow's milk; wet nurses are difficult to obtain and are apt to be troublesome; so there has been created a dairy of mothers who have their milk collected at their own homes under the most careful aseptic conditions. These mothers have to submit to most careful investigation as to their social and medical history, and submit to a Wassermann test. We doubt if such an organization would be possible in this country. A good suggestion for supplementing the food value of diluted cow's milk is the addition of vegetable and meat broth; this, with a little cream and milk sugar, makes a food of great nutritive value.

Dr. Langmead's article on *Rickets* is a valuable addition to our knowledge of the subject. The most recent observations do not encourage the belief that it is due to defective feeding; it is regarded more as the result of too limited air space and lack of exercise. It appears to be due less to the absence of lime than to the deficiency of phosphates. Excess of carbohydrates favours the condition, especially if there is lack of sunlight and exercise. Cod-liver oil and sun-baths appear to have a great curative influence.

The Meltzer-Lyon method of draining the biliary passages without surgical interference has created much attention in America, and Dr. Robert Hutchison gives a very full account of the technique in his article *Biliary Drainage*. The method is one which takes considerable time and skill. The best field for its use appears to be in the milder types of cholecystitis and choledochitis, where no marked obstruction exists. Many such cases are apparently cured, or greatly relieved.

The 'test meal' is rather going out of fashion, and the fractional method, described in our last issue, has not done much to improve the position. So we gather from Dr. Hutchison's article on *Gastric Analysis*. He tells us that the results of gastric analysis are purely empirical. Experience has shown that in the main certain diseases are associated with certain types of acidity; pyloric and duodenal ulcers have a high acidity, while cancer, in the usual course, has a low acidity. It supplies evidence which must be given its full weight in connection with other clinical and radiographic findings. In this connection Dr. Hutchison points out (*Gastric and Duodenal Ulcer*) that *x*-ray diagnosis of ulcer is not yet infallible, and the evidence of the radiologist has to be considered in its relation to the clinical history and symptoms. After all has been done, it may be necessary to resort to laparotomy to come to a definite decision. The use of caustic soda in the treatment of both gastric and duodenal ulcer appears to be an important advance in therapeutics. It acts not only as an antacid, but by arresting the action of ferments, and also by slightly cauterizing the ulcer. Glaessner gives 2 oz. of a 0·2 to 0·4 per cent solution of NaOH in peppermint water every two hours. He obtained good results, although no special diet was observed and the patients were not kept at rest. (A solution of 0·4 per cent represents 35 gr. to the pint.)

In the article *Gastro-enterostomy*, Dr. Hutchison discusses the dyspepsia which may occur subsequent to the operation. He quotes Spriggs and Marxer, whose opinion is that the outlook of patients who are ill after this operation is not so depressing as it appears. With medical treatment more than half these patients completely recovered or attained an improvement in health. In selected cases the result of a second operation is not merely good but brilliant.

A valuable paper on *Gastroptosis* is reviewed. Excellent suggestions are given as regards both diagnosis and treatment.

The article *Arthritis* offers the practitioner a wide choice of remedies. He can inject autogenous vaccines without much risk of unpleasant local or general reaction, but polyvalent streptococcal horse serum is inclined to produce anaphylaxis. Typhoid bacilli, in doses of 10 million bacilli, is rather dangerous on account of its uncertain dosage, the presence of endotoxins, and the risk of contamination with live organisms. Protein therapy may be employed, with no bad results beyond headache, nausea, and vomiting. If the practitioner prefers intramuscular injections, he may use milk, with the result that chills, fever, headache, and depression occur in only about half the cases, and then usually persist for five or six days; or he may inject sulphur suspended in olive oil into the muscles. For intravenous injections he may use sodium salicylate, iodide of potassium, perchloride of mercury, or cacodylate of iron. The advantage of these intravenous injections over the same remedies given by the mouth is not made clear. Advantage is only claimed for these methods in the more acute cases ; but it happens that it is the acute cases which alone have the tendency to natural recovery.

Lieut.-Colonel Lister, I.M.S., in his articles on the eye, has gathered much information of practical interest to the practitioner, and has rendered it more valuable by affording indications for treatment based upon his own wide experience. Corneal ulcers frequently come under the treatment of the general practitioner. and the information given in the article *Cornea, Diseases of*, cannot fail to be helpful. The use of a saturated solution of magnesium sulphate as an eye-bath in chemotic conditions of both cornea and conjunctiva, in large corneal ulcer, or in gonorrhœal ophthalmia, is mentioned ; but nothing is said about the temperature of the bath, nor have other writers done so. The action of the medicament is largely osmotic, and the best effects are obtained when the solution is comfortably warm. It should not be used cold. The same remark applies to lotions used for the eye or drops instilled ; they are always more soothing when warmed before use. Lieut.-Colonel Lister speaks highly of xeroform in corneal ulcers of a severe type. It is dusted into the eye twice daily.

In the article *Eye, General Therapeutics of*, attention is called to the harm which results from the too frequent repetition of local remedies. This is in keeping with the line of thought which is gaining ground in reference to the action of most therapeutic agents, especially vaccines. The time for repetition appears to be when the remedy has exhausted its effects ; otherwise the natural processes which make for recovery are not able to take place. There is much in this view to commend it. In the case of the eye the prolonged use of atropine may set up a conjunctivitis, and the conjunctiva can be rendered black by the prolonged use of silver salts. Even dionin may increase the corneal opacities and thickening of the conjunctiva if it is given too frequently. In the treatment of trachoma, acriflavine appears to give the most satisfactory results. The technique of its use is explained in the above article.

We all know that headaches are frequently caused by ocular defects, but it is rather a novelty to use the form of the headache as a means of diagnosing the ocular error. J. A. Kearney tells us that frontal or supra-orbital headache indicates hypermetropia, occipital headache an imbalance of the external ocular muscles, and temporal headache an astigmatic error. (*Eye Affections, General.*)

The article *Refraction* contains some very practical suggestions in reference to the ordering of glasses in certain cases. This is not always a mere question of optical measurement ; there is a personal equation to be considered if satisfaction is to be obtained. Some new tests invented by Dr. Maddox are likely to prove very helpful. They are illustrated and described in the article.

Under what circumstances is *Cæsarean Section* justified? This subject is fully considered by Dr. Fothergill, who quotes J. M. Munro Kerr's views. Contracted pelvis, tumours, eclampsia, placenta prævia, accidental hæmorrhage, abnormal positions of child or uterus, may all suggest the operation, and indications are given as to when the necessity arises. Munro Kerr says "vacillation in obstetric practice is fatal", and is convinced that in twenty years the indications for this operation will be greatly extended. Eardley Holland calls attention to the defects of the classical operation, and prefers the lower segment or cervical operation, which is fully described and has its advantages pointed out.

The $x$-ray treatment of myoma of the uterus (*Myoma*) has distinct success in the control of hæmorrhage; but as regards reduction of the size of the growth little can be claimed with certainty. No injury to the bladder or intestine was observed, but the results, although satisfactory, do not compare with those obtained by surgical removal of the growth. It is the risks of operation that alone gives the $x$-ray treatment its chance. One important indication is given: the patient should be over 40, but not have passed the menopause, as fibroids which cause bleeding after the menopause should be removed. G. Gellhorn gives the indications for the use of radium in such cases, and points out those in which it is better to operate.

Another very important point dealt with (*Ovary, Function of*) is the advantage or disadvantage of conserving the ovary. W. P. Graves is opposed to the idea that it is to the advantage of the patient to have even the minutest part of the ovary preserved: he thinks that the alleged influence of the ovary on the mature human organism has been exaggerated, and that the permanent absence of the ovarian function may be less detrimental to the patient than an irritating impairment of function resulting from mutilated organs. His views deserve very careful consideration.

The article *Pregnancy, Disorders of*, contains some valuable suggestions respecting the treatment of puerperal eclampsia. It is pointed out that it is easier to prevent than to cure this condition, and that when it occurs prompt removal to a hospital is desirable. One elementary point in treatment is starvation, nothing being given except water. The vomiting of pregnancy is regarded by Oldfield and others as a neurosis rather than a toxæmia, and is treated on this line by giving the patient ordinary diet, aperients alone being used as remedies. Such patients are best treated in a nursing home.

The recent epidemic of small-pox in London has directed attention to the extraordinary neglect of vaccination which has been permitted in this country. In Dr. Rolleston's article, *Small-pox*, will be found some very interesting statistics tracing the history of the disease in Boston from the year 1702, which prove conclusively that the number of deaths from this infection is in direct proportion to the efficiency or partial neglect of vaccination. Also, in his article *Vaccination*, some remarkable statistics are given of the results obtained in the Philippine Islands, where formerly 40,000 deaths occurred annually from small-pox. In

Manila, as a result of vaccination, not one death from small-pox occurred in seven years. But with our present knowledge of vaccine therapy our methods appear somewhat crude. Is it necessary in order to secure immunity that we should make an open wound and allow a pustule to form which leaves a lifelong scar? Recently other methods have been suggested, and the intracutaneous procedure described in the article *Vaccination* appears to have much to recommend it. Its efficiency has been proved by efforts to re-vaccinate persons so treated by the ordinary method. Dr. Joseph Priestley says (*Small-pox and its Prevention*) all experience goes to show that vaccination as a protective inoculation is sure in its action, but like all inoculations requires to be repeated at certain intervals. The value is as a protective inoculation, and though some claim that it is also a remedial or treatment inoculation, this latter value is slight, if not negligible.

The results of vaccine therapy in the other infectious diseases have not been very satisfactory. Both in *Measles* and *Scarlet Fever* (see articles) the injection of the serum of convalescent patients has been suggested as a prophylactic; but it is doubtful whether this method would recommend itself to the parents of children: even if they agreed, the protection conferred only lasts a few weeks. Neither is the method of treating scarlet fever with immune human serum likely to be adopted by the family practitioner. All that can be claimed for it is that it modifies the temperature; it has no effect upon the eruption, and does not prevent complications.

Dr. Goodall does not regard the symptom of peeling, even if it takes the form of pin-hole desquamation, as a result of scarlet fever unless there is some definite history of an illness in which sore throat and a rash were symptoms. This important question often occurs in practice.

Another point of interest is whether the same patient can have repeated attacks of measles. Dr. Rolleston (article *Measles*) says that although he has seen many cases of measles with a history of a previous attack, he has never witnessed two attacks in the same individual. The previous attack may have been rubella or an attack of non-specific character. In respect to treatment, calcium sulphide in ½-gr. doses has been recommended by E. Rice, who finds it gives prompt relief to the catarrhal and cutaneous symptoms.

In *Whooping-cough* L. Dumont recommends adrenalin chloride 1–1000 in doses of 2 to 5 drops every three hours, according to age.

Dr. Joseph Priestley shows that cancer is on the increase (*Cancer and its Prevention*). Over the age of 40 years, 1 in 8 females and 1 in 14 males die from certified cancer—a difference that is made up by the greater frequency of the disease in the breast and uterus as compared with other human organs. It is definitely an adult's disease. In the early stages cancer is curable, but in the later stages practically incurable (with a death-rate of 90 per cent).

It may be only a coincidence, but the disease appears to increase proportionately with civilization—especially *white* civilization. Some very primitive tribes are stated to be actually free from invasion by the disease.

Is cancer contagious ? It may or may not be. There is no evidence at present, though by analogy with certain other diseases it may be that the disease is a germ disease. Cancer houses and cancer districts are reported from time to time, but do not bear investigation. Is cancer hereditary ? The tendency to the disease may be. Is it a deficiency disease? Perhaps. If so, wherein lies the deficiency ? Sir W. I. de C. Wheeler also offers some interesting comments on the present position of our etiological knowledge (*New Growths*).

It is deemed advisable by some local authorities to issue pamphlets dealing with preventive measures (on broad and general lines), and pointing out the value of early operation—practically the only *cure* as at present known, with radium and *x* rays as valuable methods of treatment, but only in certain cases of the disease (superficial cancer). There is something to be said in favour of the issuing of such official pamphlets, but there is also something to be said against the practice ; for, by doing so, a scare may be created and more harm done than good. If anything definite were known as to the nature and causes of the disease, the public ought to know officially ; but, in the absence of present-day definite knowledge, it is perhaps better to hold such pamphlets back—from the general public at least.

Transfusion in pernicious anæmia has come to be regarded rather as a palliative, and its effects disappear in a short time, so Dr. Herbert French says. His own personal experiences are described in an article on this subject (*Pernicious Anæmia*).

The great question before the surgeon operating upon a case of gastroduodenal ulcer to-day, writes Dr. Wyllys Andrews (*Gastric and Duodenal Ulcer*) is, " Shall I be content with a simple gastro-enterostomy, or is some more radical procedure indicated ? " The answer, of course, lies in the relative mortality of the two procedures and the relative number of cases cured. One strong point in favour of the simpler operation is that, according to him, many of the apparent failures which follow it are to be ascribed to the persistence of hyperacidity, a point also remarked on by Dr. Hutchison. Due regard to this, in the form of a thorough alkalinization by mouth, will remove the symptoms which, persisting after operation, are apt to bring it into undeserved disfavour.

Dr. Wyllys Andrews also has some interesting remarks on our undue readiness to diagnose chronic appendicitis (*Appendix, Surgery of*), and also on the present position of our knowledge in relation to the cause of acute pancreatitis (*Pancreas, Surgery of*).

Protein therapy has been applied extensively during the past year in the treatment of asthma (see *Asthma, Bronchial*). About 50 per cent of cases give definite skin reactions to some protein substance. Dr. Arthur Latham draws attention to the fact that peptone must be injected very slowly, death having been caused by rapid injection. He points out that, when a specific protein poison cannot be established, immunization against all foreign proteins may be attempted in one of three ways :

(1) Intravenous injections of peptone; (2) The Danysz method of vaccinating with cultures of all the intestinal microbes that will grow on a sloped gelatin or peptone culture; (3) Massive intravenous injections of dead typhoid bacilli. All these methods at times give good results, but are often disappointing. Rogers claims excellent results by treating asthma with autogenous streptococcal vaccine: 52·5 per cent of his cases remained well from half to four years after the treatment, 32·5 were afforded great relief, and only 15 per cent were a failure. These cases were treated in India, and the results are very much more favourable than those commonly obtained from similar treatment in Great Britain.

Calcium has been increasingly used during recent years in cases of phthisis (see *Tuberculosis, Pulmonary*). In the form of the chloride it has been given in cases of severe hæmorrhage, but apart from this its systematic use has had remarkably favourably results as regards the subfebrile temperature, cough, expectoration, night sweats, and shortness of breath. More recently it has been used in the form of 'calcium colloid', and experience shows that there is no advantage but rather the reverse in attempting to increase the dose (see PROGRESS OF PHARMACY, p. 517). The results convey the impression that the effect of the lime is specific rather than chemical in its action.

For the fever of pulmonary tuberculosis Gerty and Cori report favourably on a modification of Berliner's camphor-menthol-eucalyptus injections. Only two out of 50 patients in Turban's second stage of the disease did not yield to this treatment, while 51·8 per cent of 85 patients in the third stage were similarly relieved. Two or three intramuscular injections are given weekly into the buttock. Each injection consists of: Pure iodine 0·1 grm.; camphor 0·5 grm.; menthol 10 grm.; eucalyptus oil 10 grm.; castor oil 20 grm.

Three articles of topical interest may be referred to. Botulism (see *Food Poisoning*) is briefly and comprehensively discussed by Dr. Priestley, whose article on *Professional Secrecy in Medical Practice* is also particularly timely. Both in his wide review of the literature on *Diabetes Mellitus*, and in a separate paragraph under the heading of *Insulin*, Dr. Comrie has furnished a short note on the preparation and therapeutic use of this kind of pancreatic extract, which is, of course, still on its trial.

The subject of *Nephritis*, particularly in regard to treatment, is also considered exhaustively by the last-named writer, whose paragraphs on *Kidney Function Tests* and *Uræmia* should also be consulted in this connection.

Finally, attention may be directed to certain comprehensive articles in which our contributors have successfully grappled with the task of writing a review which shall summarize to the present date our knowledge on the particular subject under discussion, such, for example, as the excellent review on diseases of the œsophagus contributed by Mr. A. J. M. Wright (see *Œsophagus*), and the articles on the surgery of the bladder and kidney by Sir John Thomson-Walker (see *Bladder; Kidney*).

# DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS.

## ABDOMINAL SURGERY, MISCELLANEOUS.

*E. Wyllys Andrews, M.D., F.A.C.S.*

**General Peritonitis.**—An experimental and clinical study by Willis[1] on the value of **Irrigation** in general peritonitis raises again a point considered by most surgeons to be settled once and for all. Contrary to the experience of most of us, Willis is strongly in favour of irrigation, and supports his point by the following evidence. The theoretical arguments against irrigation are: (1) It produces shock and lengthens the operation; (2) The peritoneum is traumatized and thus absorption is accelerated; (3) Leucocytes, fibrin, and other defensive factors thrown out are washed away; (4) It tends to spread the infection to areas not previously involved.

These arguments are answered as follows: (1) Shock can be prevented by irrigation if the fluid is warm, slightly above body temperature; also considerable fluid is thus gained by the body. (2) Many bacteria are thus washed out, and the remaining ones are deprived of the fibrin, pus, etc., upon which they are known to thrive; experiments by others are quoted in which it was shown that the injection of bacteria alone is not nearly so injurious as a mixture of bacteria and blood, pus, or other exudate. (3) The toxins of the bacteria present are diluted, and it has been shown that if equal amounts of toxins are injected into an animal, one set in dilute solution and the other strong, much less reaction is provoked by the former.

Extensive animal experiments were made, over 250 dogs being used. Considerable difficulties were met in finding any toxic agent or culture which would uniformly cause death from peritonitis if injected. On this account the results were not very conclusive. However, by repeated passage through animals such an agent was found. His results showed that of the animals treated by incision and drainage alone, 100 per cent died; of the controls (infected but not operated), 89 per cent died; but only 79 per cent died of those in whom peritoneal irrigation with normal salt solution was carried out. This was true in spite of the fact that the most severely affected animals were always chosen for the irrigation.

Willis's clinical experience was of a corresponding nature. Of 14 cases treated by conservative measures, rapid incision and removal of the focus, 7 died. Of 19 cases in which the treatment was exactly the same except that irrigation was carried out, only 3 died.

The use and extent of **Drainage** in such conditions has always been a matter of considerable discussion. In the opinion of Churchill[2] it should be minimal. A series of 75 cases is quoted in which this principle had been adhered to, and but 4 deaths occurred. Deaver[3] and Groves[4] are in agreement with the majority, that the business of the surgeon is to remove the focus with as little trauma as possible, and get out. Unless actual thick pus is present, drainage is of little avail; and even if drainage is provided, the discharge is generally slight. Too liberal drainage is not only useless, but is an actual danger, tending to cause perforation of damaged viscera, and being only an added insult to an already seriously diseased peritoneum.

Lienhardt[5] is strongly in favour of the treatment of peritonitis by **Lavage with Ether.** The use of strong antiseptics on the inflamed peritoneum has been tried by numerous surgeons with slight success. Of the various substances in use, practically all have been abandoned except ether. It is said to have certain peculiar advantages. Post-operative pain is said to be reduced almost to nil. Not only is the actual bactericidal effect valuable, but there is a tremendous outpouring of lymph and exudate of great germicidal value. Finally, being extremely volatile, very little is left by the time the belly is closed, and that is absorbed with great rapidity. A rise in the leucocyte count is also produced. Of 101 cases thus treated, 18 per cent died. This does not seem to be materially below the ordinary mortality for cases of this type. Sigwart[6] not only believes in the therapeutic value of ether, but uses it routinely as a prophylactic measure where the peritoneum has been soiled at operation. His work is mostly in gynæcological conditions, and the results he reports are excellent. No cases of shock from its use are noted. The resulting adhesions are the greatest drawback, and for this reason it should not be applied except when really necessary.

**Adhesions.**—Adhesions resulting from peritonitis or from operations are a constant source of worry to the surgeon, and many attempts have been made to devise ways of avoiding them. Martius,[7] in a study of the subject, exonerates iodine from skin sterilization as an important factor. Incomplete peritonealization, collections of blood and lymph in the serosa, and intraperitoneal drains are usually the offending agents. His studies indicate that the best prophylactic measure is early and frequent motion. Not only is the patient encouraged to turn from side to side and have the head and shoulders raised, but care is also taken that the intestines are not allowed to rest ; early food taking, and catharsis if necessary, will prevent a large percentage of troublesome adhesions.

Puls,[8] in a number of cases where it proved impossible completely to peritonealize denuded areas, has covered them with silver foil. This foreign body has always lain quietly in the tissues and caused no irritation. Some of his cases reopened later showed the foil to have become quite adherent to the underlying raw spots, but to have prevented effectually the formation of any adhesions. Of greater promise, however, is the work of Williamson and Mann.[9] After much experimental study, they give us the formula of a mixture of gum acacia and gelatin which can be painted over a raw spot, and according to their experience this is an effectual preventive of adhesions. Powdered acacia is dissolved in normal saline solution, an equal amount of gelatin is added, and the mixture is then boiled, after filtration, until the fluid content equals about 50 per cent of the mixture. The solution, while still hot, is poured into flexible lead tubes (tooth-paste tubes), which are sealed, and placed in 70 per cent alcohol, after another boiling to ensure sterilization. Before using, they must be softened by immersion in warm water, as the material becomes quite hard at room temperatures. This substance is dissolved in the body fluids after a short time, and hence has considerable advantage over silver foil, which might act as a nidus for future infection as all buried foreign bodies are known to do.

**Transverse Incisions.**—The advantages claimed for these incisions are again brought to our attention by Moore.[10] He enumerates twenty advantages, of which we quote only a few. First, the nerve-supply of the muscles is not injured ; this cannot be denied, and to our mind is the most important point in their favour. Another important point is that the fascial sheath of the rectus is split, not cut, so when the closure is made the stitches are at right angles to the direction of the fibres and do not tend to pull out ; this is especially true of the upper abdomen, where the longitudinal fibres in the rectus sheath are fewer and thinner. Thirdly, the edges of the wound retract more easily, and exposure is better; to the reviewer this point seems to have a natural corollary, i.e., the tension on stitches to close the wound would be greater. Finally, Moore claims that fewer post-operative hernias follow; this, of course, is the all-important, and in fact the only, criterion of the worth of the method, and we are compelled to say that we regard it most decidedly as an unsettled question. Vogeler,[11] in a paper on this subject, cites two of his cases in which severe infection of the wound took place and extensive sloughing of the abdominal wall occurred, all the layers giving away except the really vital one, the fascia. He says that in a longitudinal incision with such virulent infection, hernia would most certainly have resulted.

**Free Fat or Omental Transplants.**—With the ever-increasing use of these transplants within the peritoneum, some experimental work by Mann[12] is of great interest. It has become almost routine in many clinics to use bits of omentum to cover defects in the peritoneum, and for many other purposes. Extensive experimental investigations prove that such free transplants, although they seldom slough, soon shrivel into a mass of fat-free scar tissue. They are prone to undergo severe inflammation if used as a reinforcement of a doubtful suture line or otherwise exposed to sepsis. As a preventive of adhesions, they cannot compare with suture of the peritoneum, as a sharp reaction in the transplant may cause more adhesions than the original defect could. An interesting point is noted in the fact that such transplants, tied about a suture line in the hope of reinforcing it, may have the disastrous effect of producing a constriction when the fat is absorbed and cicatrization takes place. Condemned for use in so many conditions, Mann strongly recommends such fat transplants as hæmostatics. Packed into wounds of the spleen, liver, or kidney, their value in the control of hæmorrhage is great.

**'Closed' Treatment of Infected Operative Wounds.**—Watkins[13] has made a plea for this procedure. He believes that the tendency is to 'over-treat' such wounds. For many years he has employed the following method. "(1) No sutures are removed until the wound is healed; (2) No drainage material is inserted; (3) No probing or manipulation of the wound is permitted; (4) Moist dressings are kept continuously over the wound as long as it remains reddened or indurated, care being taken not to macerate the tissues excessively." The moist dressings prevent sealing of the edges of the wound, and thus adequate drainage is provided. The scars of wounds treated in this manner are smaller, and the healing is quicker. The most important observation is that among the patients who could be traced there were no cases of hernia, a remarkable record, considering that the series extends over fifteen years. Previous to the introduction of this method a considerable number of hernias had occurred.

REFERENCES.—[1]*Surg. Gynecol. and Obst.* 1921, Oct.; [2]*Brit. Med. Jour.* 1922, April 15; [3]*N.Y. Med. Jour.* 1921, Sept. 7; [4]*Med. Jour. of Australia*, 1921, Sept. 10; [5]*Schweiz. med. Woch.* 1921, July 21; [6]*Münch. med. Woch.* 1922, April 7; [7]*Ibid.* March 3; [8]*Surg. Gynecol. and Obst.* 1921, Aug.; [9]*Ibid.* 1922, March; [10]*Ann. of Surg.* 1922, Jan.; [11]*Zentralb. f. Chir.* 1922, Feb. 4; [12]*Surg. Clin. of N. Amer.* 1921, i; [13]*Jour. Amer. Med. Assoc.* 1921, Aug. 27.

**ABSCESS OF LIVER.** (*See* AMŒBIASIS.)

**ACNITIS.**—For differential diagnosis, *see* LUPUS (DISSEMINATED MILIARY).

**ADENOIDS.** (*See* TONSILS, DISEASES OF.)

## ADENOMYOMA.

*W. E. Fothergill, M.D.*

In a series of 3388 hysterectomies for myomatous growths done at the Mayo Clinic, McCarty found that 211, or 6·4 per cent, of the growths were adenomyomata. He reported that not one of the 211 adenomyomata was diagnosed as such before operation. Amongst 1283 uterine myomatous growths, Cullen found 73, or 5·7 per cent, adenomyomata. He maintains that careful observation will make clinical diagnosis of these cases possible. But uterine adenomyoma is not of much practical importance, the treatment being the same as that of myoma.

These growths undergo malignant changes but rarely. H. G. Kuehner,[1] however, reports an interesting case of recurrent adenomyoma. The patient was a single woman, age 43, who complained of irregular profuse and painful menstruation. There was a polypus the size of a small orange in the vagina, hanging by a pedicle which extended through the cervix from the uterine cavity. This was found to be an adenomyoma. Fourteen months later the symptoms returned, and a firm mass the size of a fœtal head was found in the vagina, attached within the uterus by a slender pedicle. This growth was of the same nature. Eight months later there was continuous bleeding. The uterus was considerably enlarged, and was removed. Within it three distinct sessile tumours were found, on broad bases. These were adenomyomata of varying consistency, and contained in parts small cysts with smooth linings and straw-coloured content. There were no definite evidences of malignancy, and the patient was well fifteen months after the hysterectomy, though the cervix was not removed.

Cullen has indicated that adenomyomata are to be found in the uterus, the recto-vaginal septum, tubes, round ligaments, utero-ovarian ligaments, utero-sacral ligaments, sigmoid flexure, rectus muscle, umbilicus, and ovaries. A vast amount has been written about these growths, and numerous difficult operations have been undertaken for their removal, many of them with fatal results. The reason for these interventions is not obvious, seeing that the condition is generally described as benign. Interest in the subject has been revived recently owing to the recognition of its relationship with the growths known as tarry cysts of the ovaries. Not that there is anything new in the statement that the ovary may contain tissue like endometrium, for in 1899 W. W. Russell reported a case in which an ovary, normal to the naked eye, contained a thick-walled cyst. The wall of this cyst and the solid portion of the ovary alike contained 'uterine' tissue.[2]

De W. B. Castler[3] reported a similar case, and C. C. Norris[4] described another. J. C. Janney[5] adds three cases of the same ovarian anomaly. These three cases all show the occurrence of 'uterine tissue' in the ovary. They were found incidentally in the course of examination of 4853 specimens. The ovaries were not primarily affected, but were removed with the uterus on account of pelvic infection in one case, prolapse in another, and hæmorrhage in the third.

J. A. Sampson[6] calls attention to the importance of perforating hæmorrhagic or chocolate cysts of the ovary, and especially their relation to pelvic adenomata of the endometrial type. He reports on 23 cases in women between the ages of thirty years and the menopause. He considers it to be a common condition met with in nearly 10 per cent of women of the above age limits who require abdominal operations for pelvic disease. In one year he found 14 in 178 patients. The cysts are generally small and adherent; and in freeing them the 'chocolate' contents escape because a previous perforation, which had been sealed up by adhesions, is reopened. Adenoma of endometrial type is present in the tissues involved by the adhesions in a large percentage of the cases. Sampson considers that these cysts of the ovary are hæmatomata of endometrial type. They are active during the menstrual life of the patient. Histologically their lining is similar to that of the uterine hæmatomata caused by the retention of 'menstrual' blood which are often present in adenomyoma of the uterus. The 'chocolate' contents of the ovarian hæmatomata resemble old menstrual blood. The fact that material escaping from these ovarian hæmatomata may give rise to adenoma of endometrial type in the tissues thus soiled is further proof that the hæmatomata contain endometrial tissue. Sampson cannot state that this is the only cause of ectopic pelvic adenomata ; but he thinks the condition found in many of his cases is analogous to the implantation of ovarian papilloma or cancer on the pelvic peritoneal surface from the rupture of an ovarian tumour containing these growths. He believes that the growth is primary in the ovary, and that the extension is from the ovary to other tissues and not the reverse.

A. Donald[7] reports a number of cases of rectovaginal adenomyoma associated with cystic ovarian tumours with tarry or chocolate contents ; 5 cases were operated within a period of twelve weeks ; in 3 panhysterectomy was done, in 1 salpingo-oöphorectomy with removal of a nodule from the posterior aspect of the cervix, and in 1 removal of a hard growth from the anterior wall of the rectum after separation of adhesions. In 3 of the 5 cases the ovaries contained cysts with tarry or chocolate-coloured fluid. He had gradually formed the opinion on clinical grounds that these were not due merely to an accidental effusion of blood into a cyst, but were really adenomyomata of the ovary. They had the faculty of burrowing into tissues and of forming very firm adhesions ; the contents resembled exactly the thick tenacious brown fluid that was found in hæmatocolpos and hæmatometra, and in smaller quantities in the gland spaces of adenomyomata. Further, there was always acute dysmenorrhœa during the first two days of the menstrual period.

The same author,[8] writing on adenomyoma of the rectovaginal space and its association with ovarian tumours containing tarry material, gives 5 additional cases operated on since the date of his earlier communication. His total is thus 10 cases of adenomyoma seen during the first half of this year, in 7 of which tarry ovarian cysts occurred. After reviewing the subject, Donald concludes that when operating for adenomyoma the patient ought to be informed that both ovaries may have to be removed, and that when removing tarry ovarian cysts, a careful investigation for adenomyomatous growths in other parts of the pelvis ought to be undertaken at the time of operation. He considers that these growths are much more common in gynæcological practice than has been supposed.

W. Blair Bell[9] considers the term 'endometrioma' preferable to that now used, on the ground that not merely glandular tissue, but functional endometrium is found in these tumours during reproductive life. He gives the details of a case in which 'endometrium' was demonstrated in both ovaries, associated with normal uterus and tubes. The ovaries both contained cavities holding thick, dark blood. Supravaginal hysterectomy was done, and an apparently healthy portion of the left ovary was used for an ovarian graft in the right rectus muscle, the remainder of both ovaries being sent to the laboratory. The patient had menopause symptoms for a time, but has subsequently menstruated three times, although the cervical portion of the uterus left *in situ* was only 1 inch in length. Blair Bell concludes that the observation of Sampson as to the cause of the so-called 'chocolate cysts' is a very interesting pathological contribution to the solution of a clinical difficulty.

W. F. Shaw and W. R. Addis[10] mention 6 recent cases of adenomyoma, in 5 of which tarry ovarian cysts were present, and in 2 areas of endometrial tissue were found in the ovaries. They describe one of the cases in detail, and give an explanation of the fact that extensive search has often failed to reveal the presence of endometrium in ovaries containing 'tarry' or 'chocolate' cysts. It is that the endometrium within such cysts is gradually thinned out by the pressure of the blood added at each menstrual period to the content of the cavity, until all its distinctive characteristics are lost, and nothing is left but a flattened endothelium-like lining. One of their specimens showed gland spaces lined by a single layer of cubical epithelium, supported by an embryonic stroma indistinguishable from that of the endometrium and lying on a layer of unstriped muscle. In view of the paucity of muscle in the normal ovary, the authors regard this observation as having special interest.

References.—[1]*Amer. Jour. Med. Sci.* 1921, Sept., 424; [2]*Johns Hop. Hosp. Bull.* 1899, x, 8; [3]*Surg. Gynecol. and Obst.* 1920, Aug., 150; [4]*Ibid.* 158; [5]*Amer. Jour. Obst. and Gynecol.* 1922, Feb., 173; [6]*Arch. of Surg.* 1921, Oct., and *Amer. Jour. Obst. and Gynecol.* 1921, Nov., 526; [7]*Brit. Med. Jour.* 1922, i, 839; [8]*Jour. Obst. and Gynæcol. Brit. Emp.* xxix, No. 3, 1922, 451; [9]*Ibid.* 443; [10]*Ibid.* 452.

## ALASTRIM. (*See also* Small-pox.) *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

L. M. Moody[1] has described this mild form of small-pox as seen in Jamaica. The incubation period appears to be from ten to fourteen days. The onset is sudden, with fever, severe headache and backache, and occasionally sickness, and pain in the limbs. The rash (*Plate I*) appears most often on the third and fourth days, and from the second to the fifth, accompanied by a fall of temperature and disappearance of general symptoms. Pain in the throat, and dysphagia from eruption on the mucous membranes, may be present. Albuminuria is absent. The rash is at first papular, becoming vesicular in about thirty-six hours, and appears on the face, wrist and forearm, or both arm and face, in order of frequency, the scalp and palms and soles also being always eventually affected; it reaches maturity in six to seven days, and then dries up, usually without umbilication, and produces little pitting, while secondary rises of temperature are slight or absent. In pregnant females abortion often occurs, and the fœtuses may show scars of a similar rash, or if born alive may show the rash at or shortly after birth (*Plate II*); amongst these are the cases of two children born of vaccinated mothers, who had themselves escaped the disease. A definite relationship to vaccination is shown by the fact that in vaccinated children 84·6 per cent of the cases were mild and 0·0 severe, against 44·4 and 29·6 per cent in unvaccinated children; similar, but less marked, differences were found in adults, while in 60 persons vaccinated after an attack of alastrim, none took typically, and in 15 it failed altogether. The conclusion is that alastrim and vaccinia belong to the same group, the one disease affording almost complete immunity to the other.

W. C. Rucker[2] also reviews the evidence regarding this disease, which has been met with in the West Indies, South and Central America, South Africa, the Mediterranean area, and Great Britain, and concludes that the disease should always be diagnosed and dealt with as small-pox, although of a mild type.

References.—[1]*Ann. of Trop. Med. and Parasitol.* 1922, March, 21; [2]*U.S. Public Health Reports,* 1921, Dec. 9, 3023.

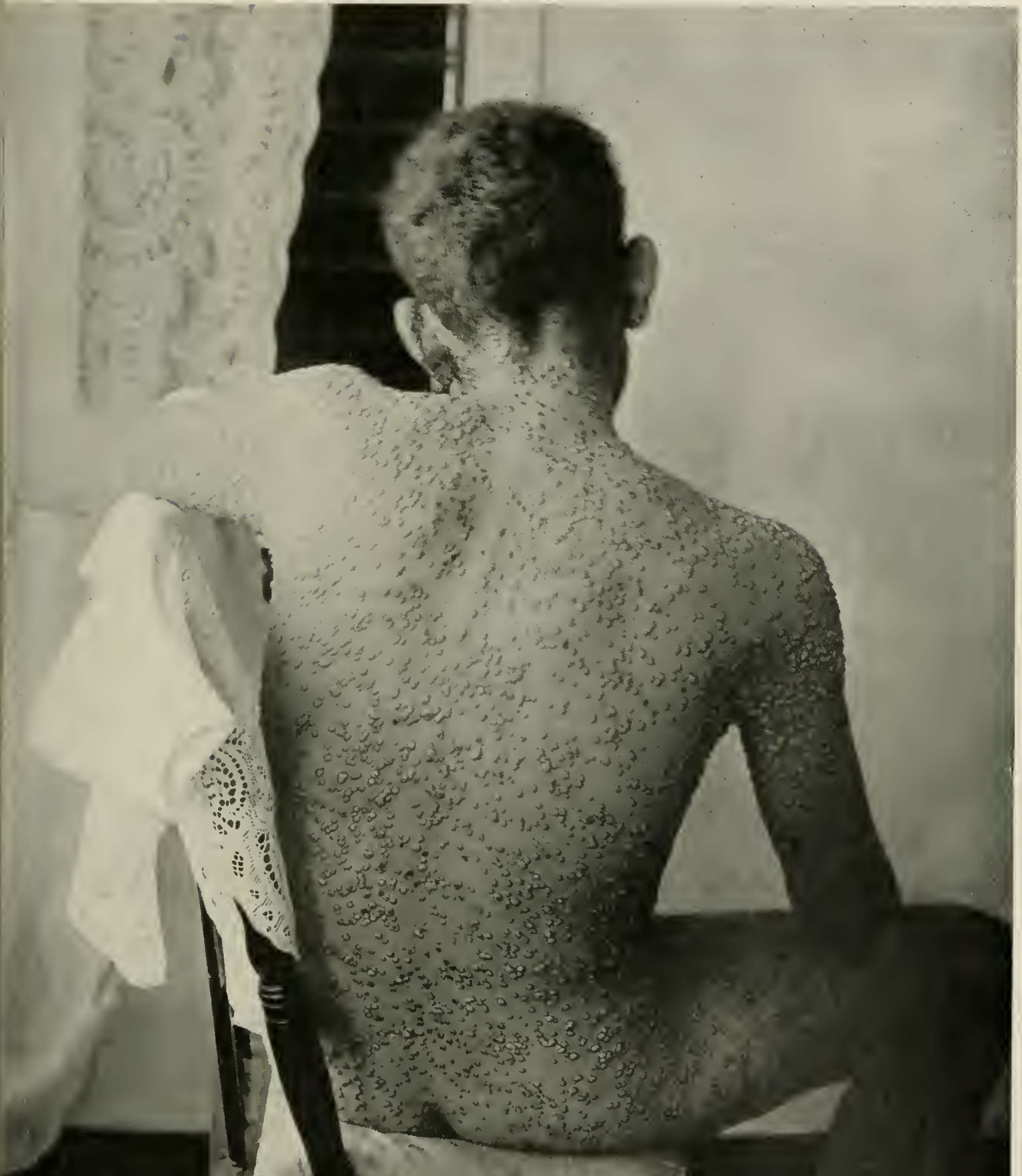
## ALCOHOL AND MENTAL DISEASE. (*See* Mental Disease.)

## ALOPECIA. *E. Graham Little, M.D., F.R.C.P.*

*Alopecia Areata.*—Sabouraud[1] remarks that there is only one true syphilitic alopecia—namely, that in small patches coming on roughly seventy-five days after the roseola, just as that eruption is due seventy-five days after the

# *PLATE I.*

ALASTRIM



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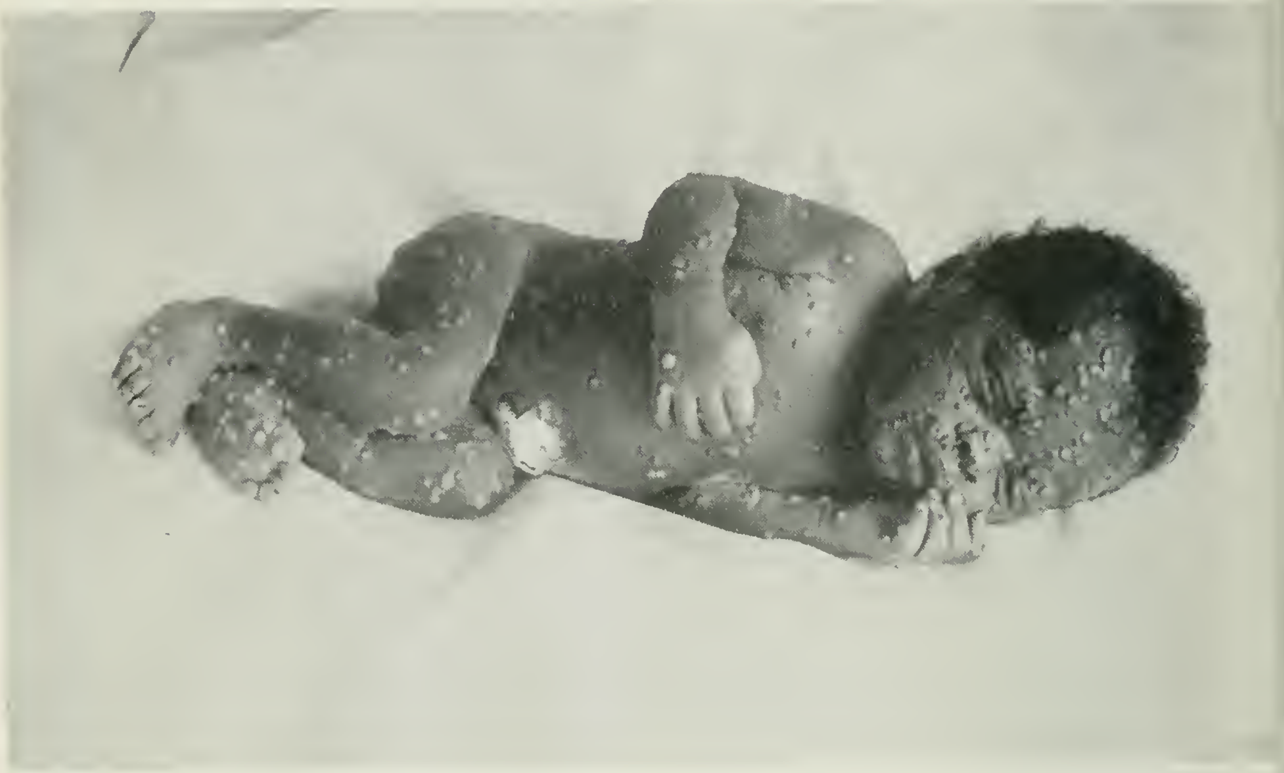
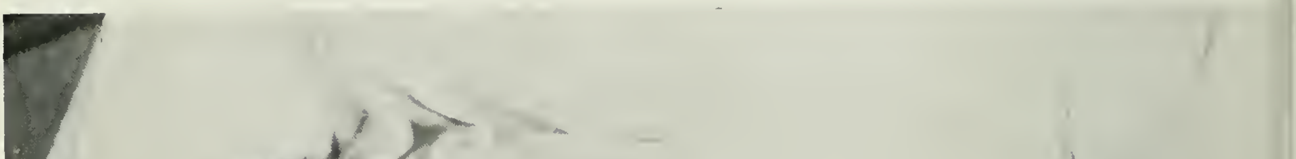
*MEDICAL ANNUAL, 1923*

# *PLATE II.*

ALASTRIM—*continued*





*By kind permission of the 'Annals of Tropical Medicine and Parasitology'* chancre. This is merely a post-infective alopecia comparable with that after severe fevers. But he also states his conviction that hereditary syphilis is too frequent an association of alopecia areata to be an accidental one. He has found, in an extended trial of alopecia areata in young people, that Wassermann reactions were positive three times more often than in young people suffering from tinea, used as a control.

*Alopecia Præcox.*—MacKee and Andrews[2] contribute a useful paper, with some practical suggestions, elementary, but too often overlooked. It is important to make a careful local examination. If the patient is a woman, the hair should be let down. In any case the scalp should be carefully inspected after obtaining the subjective symptoms and past history. The features to be looked for are scaliness (dry, waxy, or oily exfoliation), readiness with which the hair pulls out, congestion, paleness, site of predilection, atrophy, thinness or thickness of scalp, tight or loose scalp, dry or oily hair and scalp, evidence of spontaneous regeneration of hair, splitting and breaking of hair, lustre or lack of lustre, and nodosities on the hairs. The scalp and hair should not be washed for one week previous to the examination, and should be free of ointments and chemical residues from hair lotions. The normal scalp is constantly shedding its horny layer. If it has not been washed for two or three weeks, there is likely to be a little dandruff, but this should not be mistaken for pathological exfoliation. Normal scalps differ somewhat in sebaceous activity. Some normal scalps (and hair) will not become oily for many weeks ; others will be oily in a week or two. These facts should be taken into consideration in making a diagnosis.

When a lotion is used, the best means of application are thus detailed : Use a medicine dropper of a length sufficient to extend to the bottom of the bottle. The lotion is applied to the scalp by inserting the patulous end of the dropper under the hair and forcing a little of the lotion upon the scalp. It requires only a few minutes to wet the entire scalp. Then the scalp is rubbed well with the fingers. It does no good, but harm, to apply the usual chemicals to *the hair.* It is the scalp, not the hair, that should receive treatment. Women object to wetting the hair ; men do not. Therefore a man may pour the lotion on the scalp, wetting both the hair and the scalp, after which the scalp is rubbed well with the fingers.

Resorcin and beta-naphthol must never be used when the hair is white, and with extreme caution when it is golden or light brown. A single application of a lotion containing either of these remedies may turn white hair to a yellow, green, or yellowish-green colour. The colour cannot be removed. Light-brown and golden hair is affected more slowly and sometimes not at all. It may change to green, yellowish-green, or, more commonly, auburn.

A number of useful prescriptions are given :—

I. OIL LOTION AND BRILLIANTINE.

| | | | | |
|---|---|---|---|---|
| ℞ | Ol. Ricini | ʒij | Spt. Vini Rect. 80 per cent | |
| | Dactylis *vel* Olei Myrciæ | gtt. v | | q.s. ad ℥iv |

II. MERCURY OIL SUSPENSION.

| | | | | |
|---|---|---|---|---|
| ℞ | Hydrarg. Ammon. | gr. xx | Ol. Olivæ | ℥ss |
| | Hydrarg. Oxid. Rub. | gr. x | Liq. Petrol. | q.s. ad ℥ij |
| | Ol. Rosæ Ger. *vel* Ol. Myrciæ | ♏x | | |

M. Sig. : Shake well before using.

III. SULPHUR OIL SUSPENSION.

| | | | | |
|---|---|---|---|---|
| ℞ | Zinc. Sulphat. | gr. x | Ol. Rosæ Ger. *vel* Ol. Myrciæ | ♏x |
| | Sulphur. Præcip. | ʒss | Ol. Olivæ | ℥ss |
| | Quin. Sulphat. | gr. xv | Liq. Petrol. | q.s. ad ℥ij |

M. Sig. : Shake well before using.

### IV. Mercury Ointment (Mild).

| | | | | |
|---|---|---|---|---|
| R | Hydrarg. Ammon. | ʒj | Adip. Lanæ | ʒij |
| | Ol. Amygd. Amaræ | ♏j | Petrol. Alb. | ad ℥j |

### V. Mercury Ointment (Strong).

| | | | | |
|---|---|---|---|---|
| R | Hydrarg. Ammon. | ʒj | Ol. Amygd. Amaræ | ♏j |
| | Hydrarg. Oxid. Rub. | | Adip. Lanæ | ʒij |
| | Acid. Salicyl. | āā gr. xv | Petrol. Alb. | q.s. ℥j |

### VI. Sulphur Ointment.

| | | | | |
|---|---|---|---|---|
| R | Sulphur. Præcip. | ʒj | Adip. Lanæ | ʒij |
| | Acid. Salicyl. | gr. xv | Petrol. Alb. | q.s. ad ℥j |
| | Ol. Amygd. Amaræ | ♏j | | |

### VII. Stimulating Lotion (Brunette).

| | | | | |
|---|---|---|---|---|
| R | | | | |
| | Resorcin. | ʒij | Spt. Vini Rect. | ʒij |
| | Beta-naphthol | gr. x | Aq. | q.s. ad ℥viij |

### VIII. Stimulating Lotion (Blond or Brunette).

| | | | | |
|---|---|---|---|---|
| R | Capsicin. | gr. j | Quin. Hydrochlor. | gr. xv |
| | Tinct. Cantharid. | ʒss | Spt. Vini Rect. | ʒij |
| | Chloral. Hyd. | ʒj | Aq. | q.s. ad ℥viij |

M. Filter.

### IX. Mercury Lotion (Brunette).

R Same as VII, with the addition of: Hydrarg. Chlor. Corros. gr. iij

### X. Mercury Lotion (Blonde).

R Same as VIII, with the addition of: Hydrarg. Chlor. Corros. gr. iij

### XI. Sulphur Lotion (Brunette).

R Same as VII, with the addition of: Zinc. Sulphocarbolat. ʒj

### XII. Sulphur Lotion (Blonde).

R Same as VIII, with the addition of: Zinc. Sulphocarbolat. ʒj

### XIII. Oil Mercury Lotion.

| | | | | |
|---|---|---|---|---|
| R | Hydrarg. Chlor. Corros. | gr. j | Ol. Amygd. Dulc. | ʒiij |
| | Chloral. Hyd. | ʒj | Aq. Calcis | q.s. ad ℥iv |
| | Spt. Acid. Formic. | ʒij | | |

M. Emulsify with quillaia. Add perfume or deodorant to hide odour of formic acid.

### XIV. Oil Resorcin Lotion.

| | | | | |
|---|---|---|---|---|
| R | Hydrarg. Chlor. Corros. | gr. j | Ol. Amygd. Dulc. | ʒiij |
| | Resorcin | ʒj | Aq. Calcis | q.s. ad ℥iv |

M. Emulsify with quillaia.

### XV. Solid Shampoo.

| | | | | |
|---|---|---|---|---|
| R | Thymol | ʒss | Sapon. Moll. | q.s. ad ℥iv |

### XVI. Liquid Shampoo.

| | | | | |
|---|---|---|---|---|
| R | Thymol | ʒss | Tinct. Sapon. Vir. | q.s. ad ℥viij |
| | Sod. Carb. | gr. x | | |

### XVII. Mercury Shampoo.

R XV or XVI, with addition of: Hydrarg. Chlor. Corros. gr. ij

### XVIII. Sulphur Shampoo.

R XV or XVI, with addition of:

| | | | | |
|---|---|---|---|---|
| | Sod. Borat. | gr. x | Sulphur. Præcip. | gr.xx |

### XIX. Tar Shampoo.

R XV, XVI, XVII, or XVIII, with addition of: Ol. Cadini ʒss

### XX. Drying Powders.

| | | | | |
|---|---|---|---|---|
| R | Pulv. Orris | ʒvij | Amyli (rice) | ʒij |
| | Sod. Borat. | ʒiij | Ol. Violet | q.s. |

Sabouraud[3] has made this subject his own, and in a useful article he points out the present state of our knowledge. He emphasizes the early development of the symptom, which synchronizes often with the first growth of the beard. He connects with the established loss of hair the hyperidrosis of the palms, which is an especially inconvenient handicap to medical men. He notes that while the fall of hair in men usually produces permanent baldness, women, though they lose hair continually, never become entirely bald from this cause. He distinguishes two varieties or stages of the scalp affection, precursors of seborrhœa—pityriasis simplex, in which the scales are dry, and pityriasis steatoides, in which the scales are definitely greasy. With the latter stage the loss of hair is often very rapid, and even acute in onset. The arrival of this stage can be very easily demonstrated by the pressing of a piece of tissue paper on the surface of the scalp, contact with which shows a grease spot on the paper. In such a case complete baldness is common before the age of 30, unless arrested in time.

Microscopic examination of the greasy secretion on the scalp shows a Gram-positive bacillus, *Bacillus seborrheæ*, alone if the disease is pure seborrhœa, mixed with cocci and spores of Mallassez if the steatoid stage is present. The rôle played by the bacillus is not completely understood, and the author lays stress on the close connection apparent between the cycle of events and the genital development. Eunuchs never become bald if castrated before puberty. In women the symptoms are arrested with pregnancy. There is a tradition, difficult to prove or disprove, that sexually-active men become bald sooner for those activities. Treatment can do little more than arrest loss; it cannot restore the hair. No general treatment seems of any benefit, but local measures if taken early are of great value. **Sulphur** is the agent *par excellence*, and this is the author's favourite formula :—

| | | | | |
|---|---|---|---|---|
| R | Acétone, Xylol, ou Benzine | 75 c.c | Sulfure de Carbone | 150 c.c. |
| | Tetrachlorure de Carbone | 75 c.c | Soufre Précipité Lavé | 9 grm. |

REFERENCES.—[1]*Presse méd.* 1921, July 23, 581 ; [2]*N.Y. Med. Jour.* 1921, Oct., 437 ; [3]*Presse méd.* 1922, May 31, 465.

## AMŒBIASIS. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

*Dysentery.*—J. G. Thomson and A. Robertson[1] have found Charcot-Leyden crystals in 25 per cent of amœbic stools, being a little higher than Acton's figure of 20·4 per cent, and consider their presence to be an indication for making a prolonged search to exclude chronic amœbiasis, while their presence is much in favour of a diagnosis of amœbic as opposed to bacillary dysentery. They are found in mucus, and have an average length of 25 to 50 microns, and are of whetstone shape ; they are probably derived from breaking-down proteid material, as they also occur in the mucus of bronchiectasis and asthma.

F. P. Mackie[2] reports that in Mesopotamia *E. histolytica* was found in 30 per cent of dysentery cases, the bacillary form having been the commoner of the two, while from 5 to 20 per cent of the soldiers were chronic cyst-carriers. Among the British 19·2 per cent of infections were found, and among Indians 18·5 in Basra and 27·9 in Baghdad. There was no evidence that flagellates caused diarrhœa or dysentery.

C. A. Kofoid and O. Swezy[3] have identified amœbæ, by the morphology of the nuclei of dividing forms, in sections of the bones in Ely's non-bacterial or second type of arthritis deformans, and also[4] in a case of Hodgkin's disease.

TREATMENT.—W. Allan,[5] in view of the work of Dale and Dobell showing **Emetine** had little direct action on entamœbæ and was ineffective in cat amœbic infections, has tried emetinized blood and serum from both man and cats on *E. histolytica* in fresh stools, with negative results, so the action of the drug remains unexplained. R. N. Chopra and B. N. Ghosh[6] also discuss the therapeutics of emetine, and emphasize its cumulative toxic effects, advising that not more than 12 to 15 consecutive daily 1-gr. doses should be injected in man. As it produces congestion of the lungs as well as the intestines, they think it useless in hæmoptysis. It causes no contraction, but rather relaxation, of the uterus; it produces, however, tonic contraction of the intestinal wall.

H. C. Brown[7] has examined the amœbicidal action of **Conessine**, the alkaloid of *Holarrhena antidysenterica*, or kurchi, and other allied plants of the family of *Apocynaceæ*, and found it to have an inhibitory action on free-living amœbæ equal to that of emetine.

*Liver Abscess.*—S. Fry[8] records a case of a large right-lobe abscess rupturing into the perirenal tissues and forming a retrocolic abscess, and a second case of a left-lobe liver abscess rupturing into the peritoneal cavity, with fatal results in both. L. Rogers,[11] in the Lettsomian Lectures, discusses fully amœbic liver abscess, first dealing with the etiology and its relationship to antecedent ulceration of the colon, often of a latent nature, and sterile as regards bacteria in the great majority of the cases, and also the mode of formation of the large single abscess, and the frequency of single and multiple abscesses and of secondary amœbic abscesses in the spleen and brain. The value of the blood changes in the diagnosis of amœbic hepatitis and liver abscess is pointed out, and the possibility of preventing suppuration taking place by early treatment with **Ipecacuanha** and **Emetine** demonstrated.

TREATMENT.—J. C. John[9] describes the successful treatment of a liver abscess in a very emaciated patient, who was in too bad a condition to allow of an open operation, from whom 90 oz. of pus were aspirated at the first sitting and 64 oz. sixteen days later; **Quinine Hydrochloride Solution** was injected each time, while 1-gr. doses of **Emetine** were given hypodermically daily for a week, the patient making an uninterrupted recovery and gaining 10 lb. in weight while in hospital. R. E. Ingram-Johnson[10] records a case of a visible fluctuating abscess of the liver in a patient who refused operation, which cleared up completely on emetine injections.

L. Rogers[11] discusses fully the treatment of liver abscess by the method he introduced of **Repeated Aspirations**, combined with the administration of amœba-destroying drugs into the abscess cavity or otherwise, without any open drainage, and shows that the mortality has been reduced from 56·8 per cent after the open operation in 2661 cases, to 14·4 per cent in 111 cases treated by the present method, or one-fourth of the old mortality. A case is also recorded in which multiple amœbic liver abscesses demonstrated by abdominal section cleared up completely under emetine, with permanent recovery. Curves illustrating dysentery, hepatitis, and liver abscess in the British Army in India for forty-nine years demonstrate a reduction of the death-rate from the latter to one-sixth of the former rate since the introduction of these methods.

REFERENCES.—[1]*Jour. Trop. Med. and Hygiene*, 1921, 289; [2]*Ind. Med. Gaz.* 1922, 85; [3]*Jour. Amer. Med. Assoc.* 1922, i, 1602; [4]*Ibid.* 1604; [5]*Amer. Jour. Trop. Med.* 1922, May, 195; [6]*Ind. Med. Gaz.* 1922, 248; [7]*Brit. Med. Jour.* 1922, i, 993; [8]*Ind. Med. Gaz.* 1922, 135; [9]*Ibid.* 1921, 379; [10]*Jour. Trop. Med. and Hygiene*, 1922, 138; [11]*Lancet*, 1922, i, 463, 569, and 677.

## AMPUTATIONS.

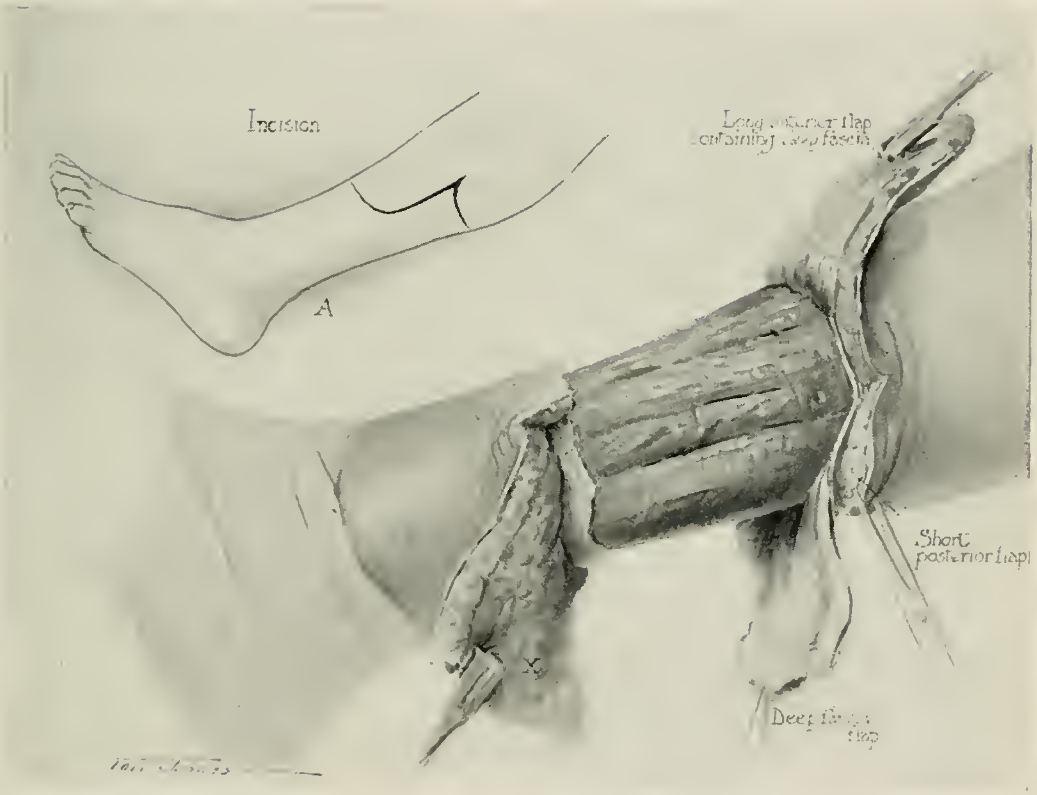
*Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Amputation of the Leg.**—T. G. Orr[1] emphasizes the importance of careful work in these operations. The most satisfactory site for leg amputation is in the middle third. In this position Orr operates as follows:—

Long anterior and short posterior flaps are made; deep fascia is included in

# *PLATE III.*

## AMPUTATION OF THE LEG

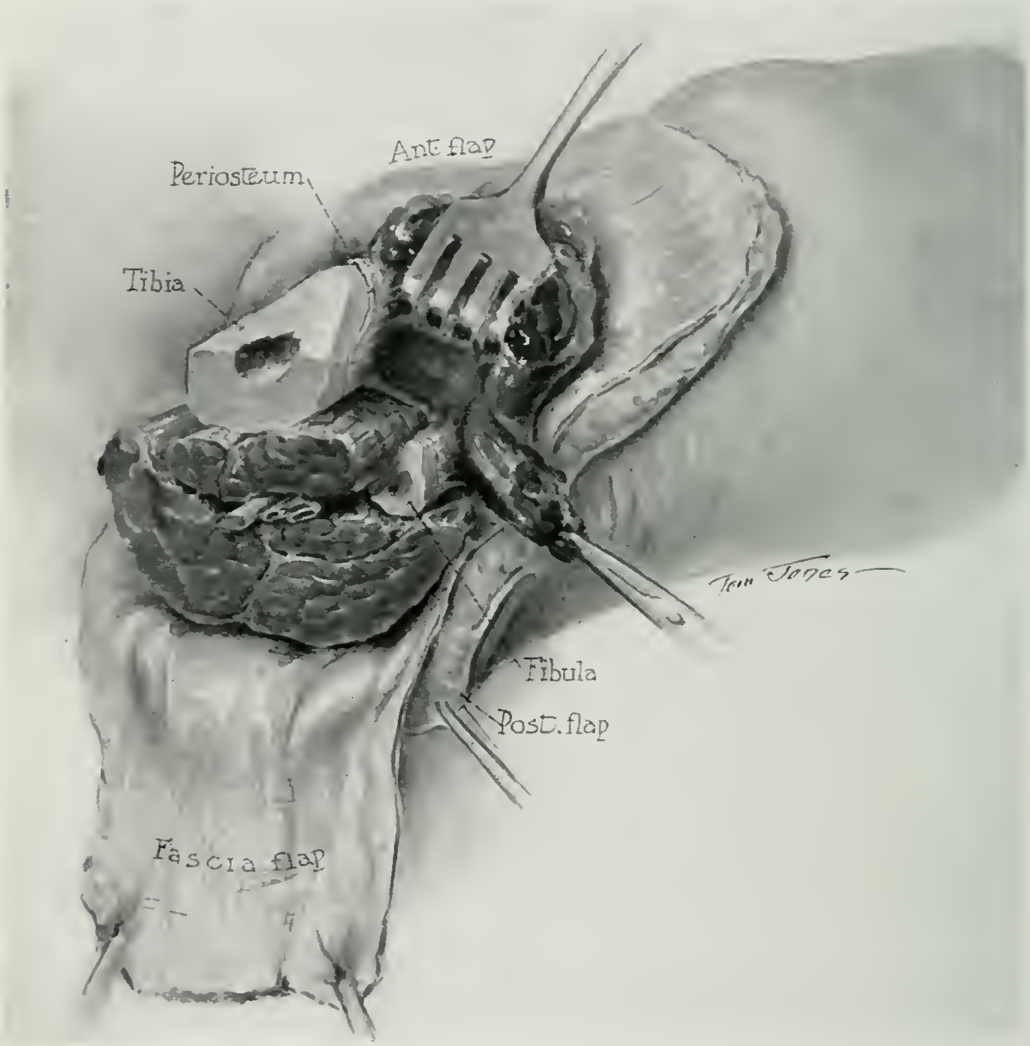


Shows incision, and skin and fascia flaps.

*By kind permission of the 'Annals of Surgery'*

# *PLATE IV.*

## AMPUTATION OF THE LEG—*continued*

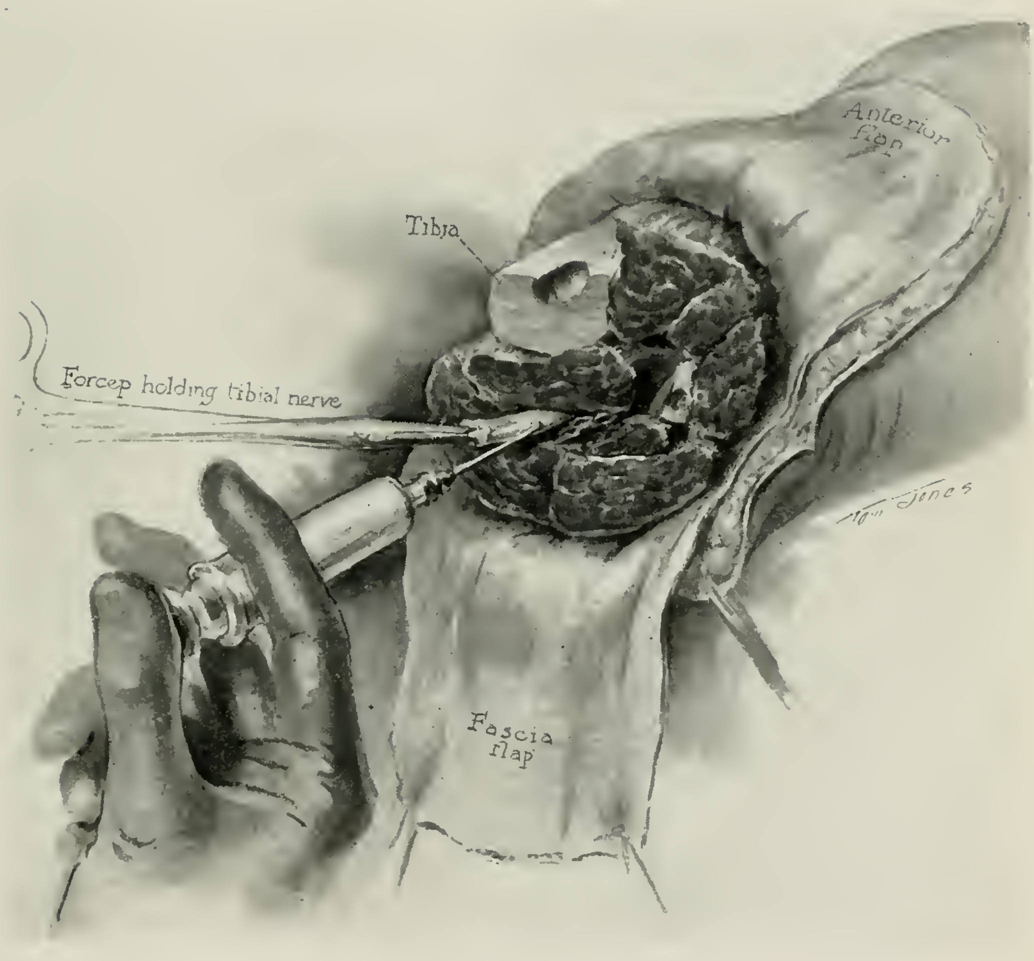


Method of treating the bones and muscle. The fibula is cut shorter and the muscle slightly longer than the tibia.

*By kind permission of the 'Annals of Surgery'*

# PLATE V.

AMPUTATION OF THE LEG—*continued*



Injecting a nerve with absolute alcohol after the method of Lewis and Huber.

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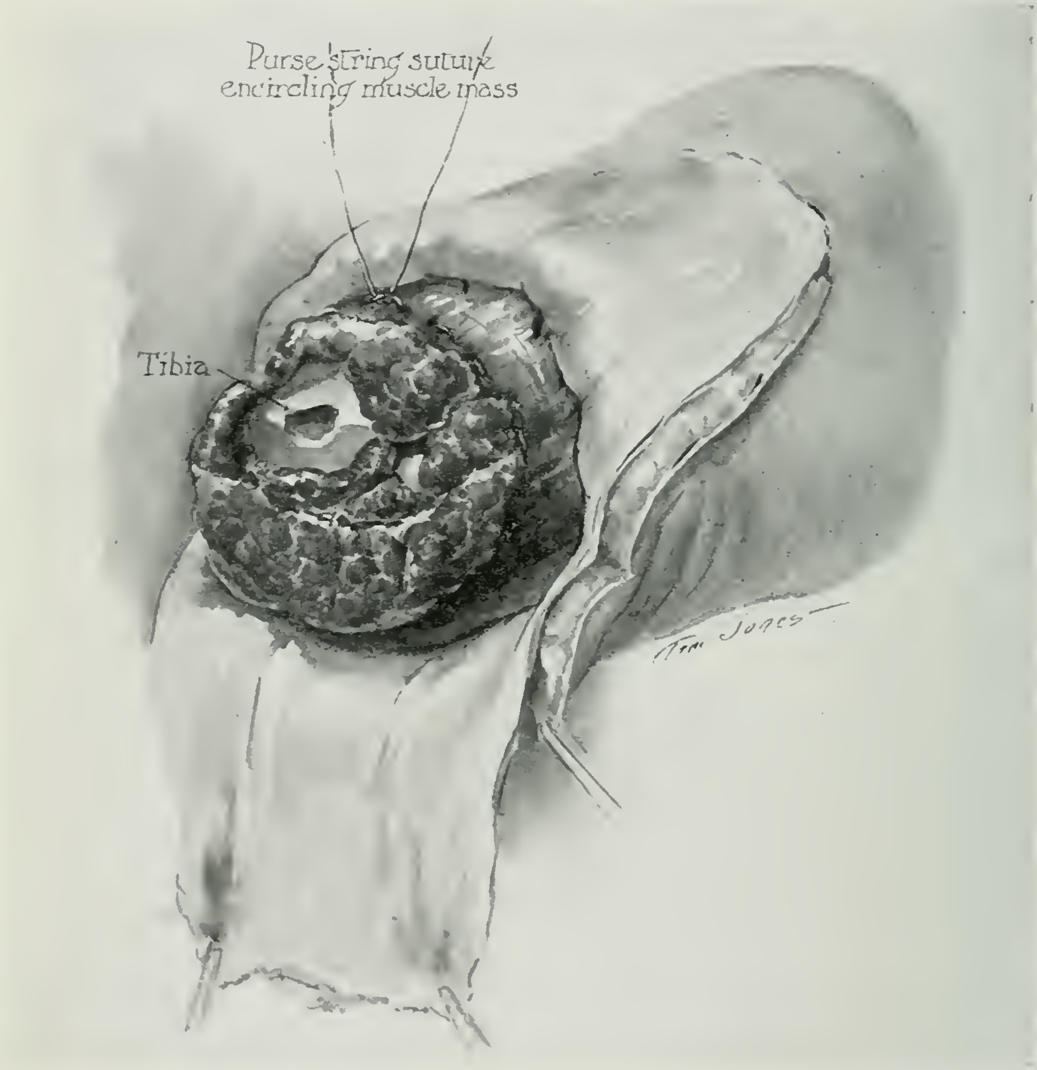
# *PLATE VI.*

## AMPUTATION OF THE LEG—*continued*



This shows the muscle grouped about the bones and held together by a heavy purse-string suture.

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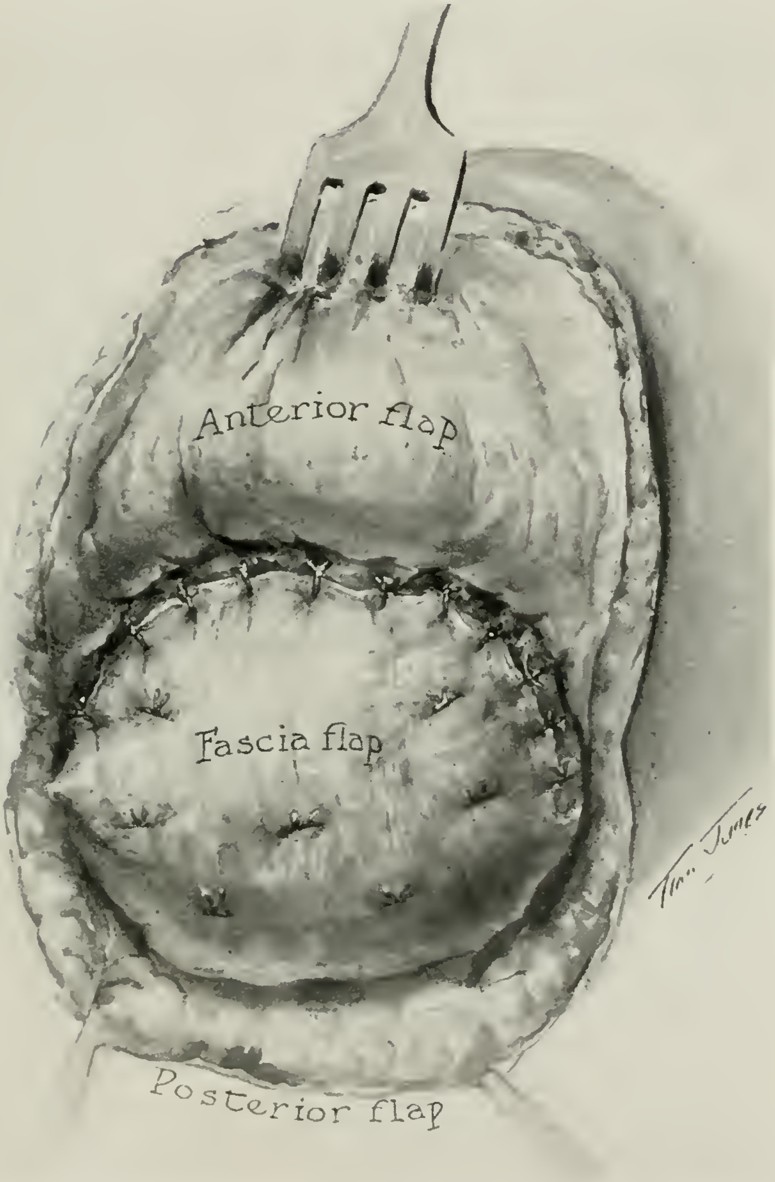
# *PLATE VII.*

## AMPUTATION OF THE LEG—*continued*



Posterior fascial flap sutured over the end of the bone and muscle group. The sutures through this flap reach deep into the cut end of the muscles to fix them firmly to the flap and to obliterate dead space.

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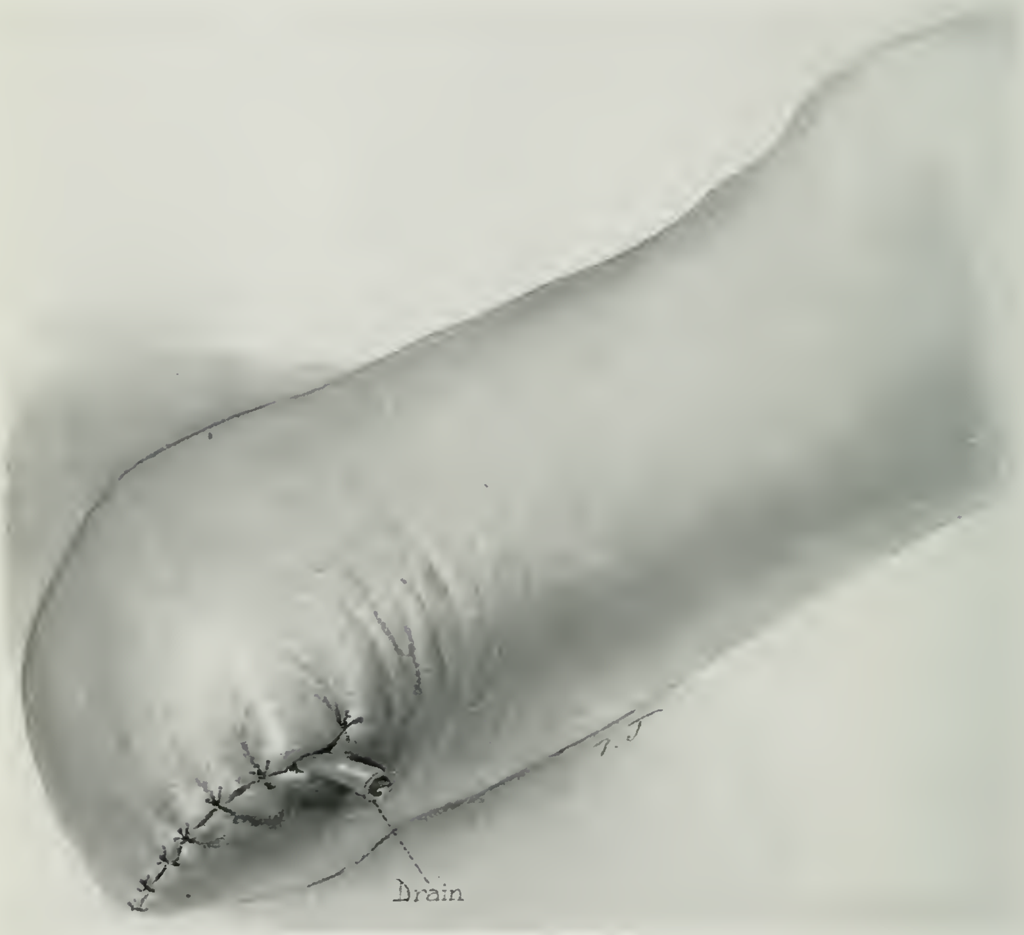
# PLATE VIII.

## AMPUTATION OF THE LEG—*continued*



The finished stump with drain in the posteriorly placed incision.

*By kind permission of the 'Annals of Surgery'*

the former. The flap is dissected back at least 3 cm. beyond the point where the tibia is to be divided. The posterior flap is quite short. A flap of fascia, as shown in *Plate III*, is fashioned from behind to turn over the cut end of the stump. The muscles are divided a couple of inches below the point of bone section. The fibula is cut, as usual, shorter than the tibia (*Plate IV*). The periosteum about the cut ends is carefully removed and the marrow is scooped out. The nerves, five in number, are drawn out of the stump as far as possible, and injected with absolute alcohol (*Plate V*). The nerve is then divided just below the injected point ; this prevents the formation of neuromata. All bleeding points are then carefully ligated, and the muscle mass is brought together by one strong purse-string suture (*Plate VI*).

It will be noted that muscle flaps are not made, nor is the muscle permitted beyond the end of the bone more than 1 cm. Orr thinks that muscle produces an unstable stump which is likely to become chafed or tender. On the other hand, if the muscle is not fixed to the end of the bone it will retract, leaving bone protruding beneath the end of the skin. The technique described fixes the muscle round the end of the tibia with a purse-string, and gives it an insertion both at the end of the bone and into the fascia which is sutured over it (*Plate VII*). The appearance of the finished stump is shown in *Plate VIII*.

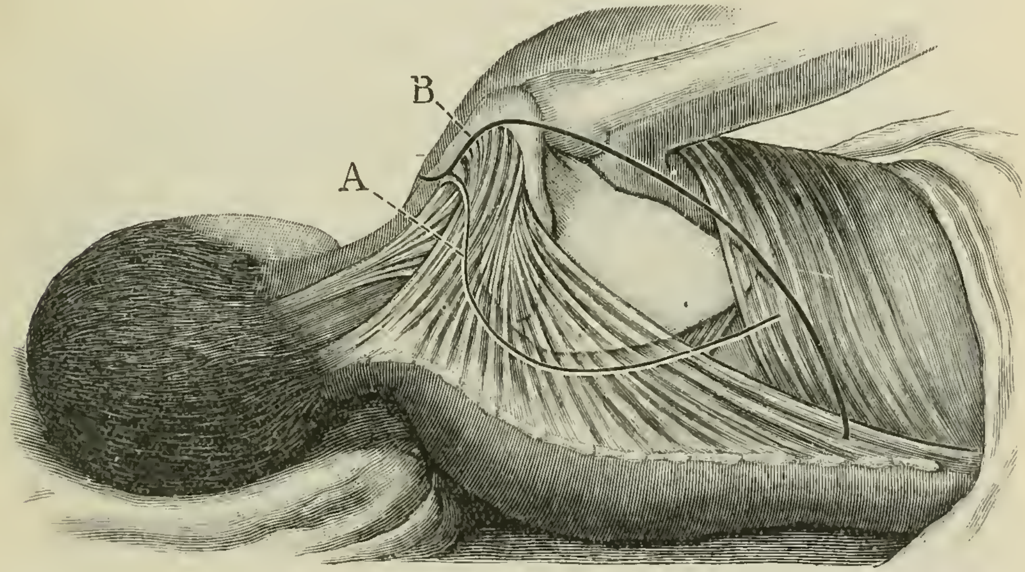


*Fig.* 1.—A, Line of division of muscles. B, Line of cervico-scapular flap.

The author concludes that the advantages of this technique are : (1) A firm rounded stump with skin and fascia freely movable over the bone ; (2) A scar properly placed so that it will not become adherent to bone or receive pressure ; (3) No tenderness due to neuromata, chafing, or ulceration ; (4) The muscles have a new insertion at the end of the stump which prevents their retraction and the exposure of the bone beneath the skin.

**Amputation at the Shoulder.**—The late Colonel Littlewood[2] describes a method of interscapulothoracic amputation. He claimed that the operation could be done with great ease, and that he had performed it himself in twenty-five minutes, including the suturing of the flaps. The flaps, of course, may vary according to the exact position of the disease ; there are two flaps, a cervico-scapular and a pectoro-axillary.

The patient is placed on the sound side close to the edge of the operating table. A cervico-scapular flap is made, commencing at the clavicle near the outer margin of the sternomastoid attachment, carried along the clavicle, over the prominence of the shoulder, along the axillary border of the scapula to a point below the angle, and backwards to about two inches from the spine (*Fig.* 1). A flap of skin and subcutaneous tissue is rapidly turned back; this exposes the posterior surface of the scapula, with the muscles attaching it to the spine. The trapezius and the latissimus dorsi are then divided, next the levator anguli scapulæ, the rhomboids, and, lastly, the scapular attachment of the serratus magnus and the omohyoid muscles. Three or four vessels may require ligature, branches of the suprascapular and posterior scapular arteries. The soft tissues are now separated from the clavicle close to the sternomastoid attachment, and the bone is surrounded by a Gigli's saw and divided; the subclavius can now be divided. The whole upper extremity now falls away from the trunk, held by the subclavian vessels and the cords of the brachial plexus, which are fully on the stretch, standing out and easily seen (*Fig.* 2).

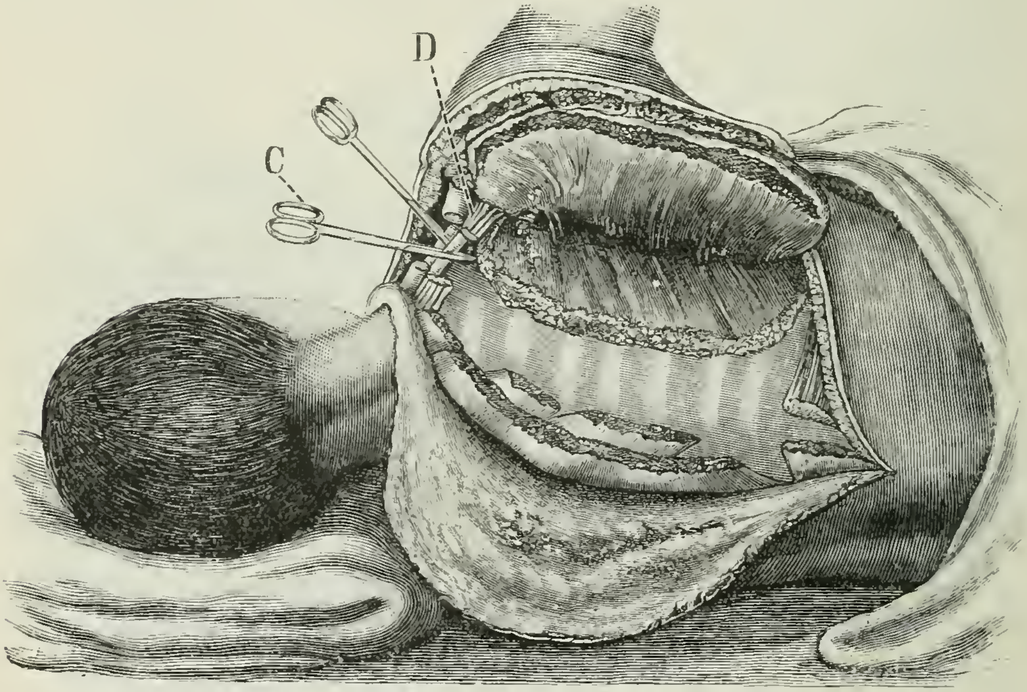


*Fig.* 2.—C, Forceps on subclavian vessels. D, Brachial plexus divided.

The cords of the brachial plexus are now divided with a pair of scissors close to the spine; an injection of cocaine into the nerve can be given before division, as has been recommended, to lessen the shock. In his three cases he had not noticed any increase of shock in division of the nerves. He had not injected cocaine. Clips are applied to the subclavian artery, which is divided between them; the vein is then seen and treated in the same way. The advantages of securing the artery first have been pointed out by many operators, and in this operation it is the easiest plan. The vessels can now be ligatured, or this can be done after the parts have been removed. The anterior or pectoro-axillary flap is then cut and reflected as far forwards as necessary.

The last stages in the operation consist in the division of the pectoralis major and minor muscles; the position of the division depends on the extent of the muscles it may be thought necessary to remove. After the division of these muscles the fore-quarter is removed. This exposes the thoracic boundaries of the axilla and the posterior triangle, so that it is now quite easy to remove any lymphatic glands which require removal (*Fig.* 3). The flaps are now sutured and a firm dressing applied. The author had recently used silkworm gut prepared with iodine for suturing.

**Amputation near the Hip-joint, Supratrochanteric.**—This subject was dealt with by Colonel Littlewood in the same article. The patient is brought to the edge of the operating table, resting on the sound side.

An antero-internal flap is first cut, beginning just below the anterior superior spine, coming down to a level to secure an adequate covering—that is, to one-third of the circumference of the hip-joint—then over the front of the thigh, and upwards on the inner and posterior aspect to a point near the ischiai tuberosity; a postero-external flap is now cut. Any flaps that are used for an amputation at the hip-joint would be suitable for this operation. He always thought the Furneaux Jordan flap far too long and bulky, but his principle of keeping the incision away from the perineum should be followed whatever flaps are made.

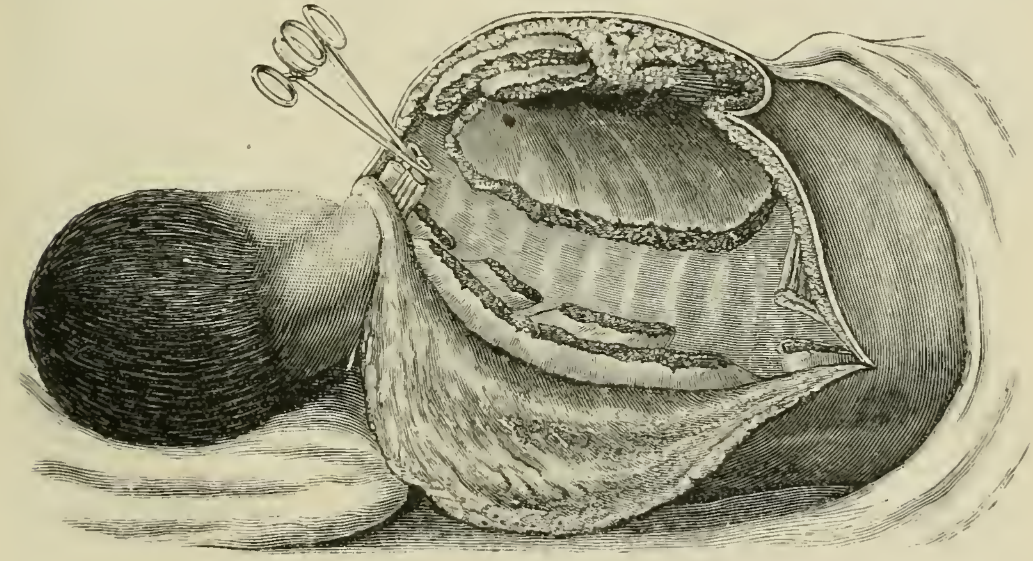


*Fig.* 3.—Fore-quarter removed; exposure of thoracic boundaries.
(*Figs.* 1, 2, *and* 3 *by kind permission of the 'British Medical Journal'*.)

The inner flap, consisting of skin and subcutaneous tissue, is now turned up about a couple of inches, the femoral vessels are exposed, clipped with forceps, severed, and ligatured. The muscles are next divided and separated as high as the neck of the femur; the iliopsoas is the last divided. The branches of the profunda artery are caught in clips, divided, and secured by ligatures; with a good assistant the loss of blood is small. The muscles in the outer flap are now divided and separated from the bone, those attached to the great trochanter being severed last. The sciatic nerve is divided after forming this flap. The flaps are held on one side; this exposes the neck of the femur.

The anterior part of the capsule of the hip-joint is attached to the anterior intertrochanteric line, and without opening the hip-joint this must be separated from the neck of the femur upwards for about half an inch by means of a raspatory; the neck of the femur is surrounded by a Gigli's saw and the bone sawn through close to the trochanter; the limb is removed, leaving the hip-joint intact. The muscles can be brought together with deep sutures and the skin secured with silkworm gut. The stump can be drained if it is thought desirable. [It is best to perform the operation by skin flaps, and the muscles should be cut short. Leaving the head of the bone in the acetabulum, as recommended by the late Colonel Littlewood, is a decided advantage. It is really an amputation through the neck of the femur, and can be well performed by means of an interior racquet incision. The soft parts should be cut so short that they cannot push the artificial limb off the tuber ischii.—W. I. de C. W.]

REFERENCES.—[1]*Ann. of Surg.* 1921, Nov., 633; [2]*Brit. Med. Jour.* 1922, i, 381.

## ANÆMIA, PERNICIOUS. (*See* PERNICIOUS ANÆMIA.)

## ANÆMIA, SPLENIC.

*Herbert French, M.D., F.R.C.P.*

A review of 26 cases of splenic anæmia out of 40 cases admitted to Guy's Hospital and diagnosed as such during the last twenty years is published in the *Guy's Hospital Reports* by Osman.[1] The 26 cases selected are those which either came to the post-mortem room or could be traced after discharge from hospital. Osler defined the disease as an intoxication of unknown nature, characterized by great chronicity, primary progressive enlargement of the spleen, anæmia of secondary type with leucopenia, marked tendency to hæmorrhage, and in many cases a terminal stage with cirrhosis of the liver and jaundice. Hence it follows that as soon as the cause of the condition is known, it can no longer be regarded as splenic anæmia. As Mayo puts it: "Incomplete knowledge is essential to the diagnosis". Banti's disease is regarded as a late condition of splenic anæmia, and no attempt is made to distinguish between the two.

In the series, the longest period of duration of the disease is twenty-four years, while one has lasted sixteen years and another twenty years from the onset of severe symptoms. All cases are not necessarily fatal even if left untreated, there being four in which the subsequent history points to the fact that the disease may be a self-limited process. It is less common below five years and after fifty-five years of age.

As regards pathogenesis, there has been no advance. From the fact that splenectomy under favourable conditions can cure the disease, it follows that the spleen must in some way be responsible, but it is not yet certain whether the disease arises primarily in the spleen, or whether the latter enlarges as the result of its reaction to a process somewhere else in the body. With the single exception of acholuric jaundice, all those conditions which have now been removed from the splenic anæmia group have been shown to be of bacterial and protozoan origin. The demonstration of an infecting agent in the remaining cases would seem to offer the most hopeful field for future research.

Syphilis may give rise to a condition which is indistinguishable from splenic anæmia except by means of the Wassermann test.

One case appeared to be due to focal infection. Three years after the complete eradication of an obvious focus of infection in the teeth, both the anæmia and the enlarged spleen had disappeared.

The conclusions are: (1) Splenic anæmia is not a specific disease, but a clinical syndrome produced by a variety of causes; (2) This syndrome is probably always the result of a chronic infection situated in the spleen itself; (3) In some cases a primary focus of infection can be discovered elsewhere in the body, and the removal of the focus will cure the disease; (4) All cases do not necessarily terminate fatally; in some the process is self-limited, and spontaneous cure results.

TREATMENT.—Early **Splenectomy**, and **Transfusion** either before or after the operation, is the best and indeed only satisfactory treatment. A Wassermann test should be done first of all. If negative, a search for and removal of any foci of infection should follow. Then, if no improvement follows, operation must be advised. A. F. Hurst lays stress on the importance of realizing that splenic rub is an urgent indication for splenectomy. Disregard of this may result in the excision being found subsequently impossible owing to dense adhesions having formed. The presence of cirrhosis, ascites, and severe anæmia does not contra-indicate operation, especially if a transfusion be given first. The use of *x* rays has been unsuccessful in the cases in which it was tried, with the exception of one. In this case radiations of the spleen were the only method of treatment adopted, and the woman is described as comparatively healthy sixteen years later.

With regard to splenectomy, W. J. Mayo[2] states that up to Jan. 1, 1921. 249 spleens were removed in the Mayo Clinic for all causes, with a mortality of 10 per cent. Of these, 21 were for splenic anæmia of unknown origin, and there were 9 deaths; 11 were removed in cases of chronic sepsis following septic arthritis, tonsillitis, phlebitis, and osteomyelitis, with 9 deaths.

Of the others, 6 were in-patients with chronic syphilis. One died and the remainder recovered. He emphasizes what is well known to syphilologists, that removal of the spleen in these cases renders them at once amenable to antisyphilitic treatment, whereas previous to this measure it is sometimes found impossible to maintain a negative Wassermann. Osman describes one case in the Guy's series in which the positive Wassermann disappeared after the splenectomy without further antisyphilitic remedies being used.

Eight spleens have been removed from children suffering from von Jaksch's disease or splenic anæmia infantum, without an operative death, and cure has followed when the disease has not been too far advanced.

REFERENCES.—[1]*Guy's Hosp. Rep.* 1922, Jan., 919; [2]*Jour. Amer. Med. Assoc.* 1921, July 2, 34.

## ANÆMIAS IN CHILDREN. (*See* BLOOD DISEASES IN CHILDREN.)

## ANÆSTHETICS.

*J. Blomfield, O.B.E., M.D.*

### METHODS OF RESUSCITATION.

Methods of resuscitation, likely to restore a patient in whom respiration and circulation fail during anæsthesia, have been under discussion recently, and we propose to give here an account of our present knowledge of the matter complete enough to be of use for future reference. We do not propose to deal with mild cases. When, for instance, during the taking of an anæsthetic the respiration gradually fails, the pulse at the time of the cessation of breathing being still palpable at the wrist, efficient performance of **Artificial Respiration** is almost constantly successful. Sudden brief failures, too, whether of breathing or of pulse, that are purely reflex results of the surgical manipulation of the moment, are always recovered from with the help of no more elaborate treatment than lowering of the head and the stimulation of the respiration that is supplied by a brisk rubbing of lips and cheeks. The serious conditions which may rise during anæsthesia are not corrected by these simple measures. The exact cause of the collapse is not always evident, nor indeed is it always the same. On some occasions the surgical procedure, whether through hæmorrhage or through the amount of injury inflicted on tissue, may be the chief cause of the circulatory failure that has to be treated. In others the anæsthetic is primarily responsible. When the failure occurs early in the course of operation, before much has been done or any specially sensitive part treated, and when the anæsthetic is partly or wholly chloroform, the symptoms must usually be attributed to the inhaled drug. Pallor comes on quickly, the breathing is faint or absent, or occurring only in gasps at considerable intervals, and the pulse is imperceptible at the wrist. The cornea is insensitive, and the pupils are widely dilated or of medium size.

The first measures to be carried out are: (1) Remove the anæsthetic; (2) Lower the head; (3) Open the mouth and draw the tongue forward; (4) Compress the chest several times at short intervals. These efforts failing to restore the breathing, artificial respiration by Sylvester's method is to be carried out.

If spontaneous breathing is not resumed and the pulse is still absent, the important question arises, How long are the above procedures to be persisted in without resort to massage of the heart? Experience, both clinical and experimental, shows that at least five minutes may safely be spent after the first cessation of the pulse before massage of the heart is tried. A very practical point must here be mentioned, viz., the importance of observing the time at once whenever a patient fails during anæsthesia. If this is not done, it is extraordinarily difficult to estimate correctly how much time is spent in the efforts at restoration. Under the unusual and rather alarming conditions of the moment, proper time estimation is for most people impossible, and actions that merely occupy seconds are often regarded by those engaged upon them as taking several minutes. It is possible to restore the beat of a heart that has ceased to contract even considerably more than five minutes after its cessation. In actual practice success has been achieved as long as thirteen minutes after the first stoppage. In this case (Mollison's) eventual complete recovery was preceded by weeks of cerebral symptoms due to the damage which the cortical cells had sustained by their long interval without proper circulation. It is here, in the delicate, highly organized, supreme portions of the central nervous system that lies the real risk of long-delayed resumption of circulation. Five minutes, then, at the least, and ten at most, we may regard as the time available for restoratory measures before proceeding to massage the heart.

**Massage of the Heart** can only be efficiently carried out in adult subjects by means of an abdominal opening through which the hand can grasp the entire heart within the pericardium. In infants it is possible to massage the heart effectively by a hand pushed into the unopened epigastrium while the other hand presses the heart down through the elastic thorax. In adult subjects, if a laparotomy is not in progress when the collapse occurs, the abdomen must be opened by an incision in the middle line or through the upper part of the left rectus vertically, and the heart massaged by the subdiaphragmatic or transdiaphragmatic route. The thoracic route has been employed, but this involves a more serious and damaging operation. For the subdiaphragmatic manipulation "a hand is inserted between the diaphragm and the left lobe of the liver. The heart is defined, and may be pressed against the posterior thoracic wall, external counter-pressure being maintained with the other hand against the ribs over the left side; or else the heart may be kneaded through the diaphragm by the closed fist. The opening in the abdominal wall should be large enough to admit the hand completely" (Norbury[1]).

The route through the diaphragm has been strongly advocated by Bost and Neave,[2] but is not generally to be preferred to the subdiaphragmatic. An incision is made from one inch to the left of the mid-line and carried outwards behind the costal margin, cutting the fibres of the diaphragm near their insertion. A blunt instrument is pushed in to open the pleural cavity, and the opening is dilated by two or three fingers of the right hand. The whole hand is then passed into the thorax in front of the pericardium. The thumb behind the sternum and the fingers round the pericardium embrace the whole heart. It may be necessary to continue rhythmical compression of the heart for several minutes before spontaneous contraction occurs. Steady squeezes should be given to the organ: about sixty to the minute. On one occasion a heart was thus massaged for thirty minutes before it began to beat. Even longer periods are recorded. It is not, however, as pointed out above, the power of the heart muscle to recover contractility which limits the time within which life may be preserved—it is the recoverability of the nerve-cells. The spontaneous contractile power of the heart is extraordinary, for experimentally not only the whole heart, but even portions of heart muscle, can be kept actively contracting for hours when removed from an animal's body, provided they are fed with suitable fluid.

At the time that cardiac massage is being carried out, **Artificial Respiration** too must be practised. Success without its aid, by massage alone, is almost impossible. Nevertheless, it is obvious that Sylvester's method, the most generally useful in operation emergencies, will probably interfere too much with the operator at work on the heart. When that is so, **Perflation of the Lungs** is the best method to adopt. The larynx must be intubated. If there is no special instrument at hand, a catheter must be passed into the glottis—not a very difficult performance in the flaccid patient. Then the lungs can be inflated, either by attaching an oxygen cylinder or foot bellows, if either is present ; or, if not, simply by blowing down the catheter. If oxygen is used, the stream must be run in with extreme gentleness, and the same applies, of course, to the use of the bellows. Even mouth-to-mouth perflation must be tried if there is no means of employing the above better methods.

*Rationale of Massage.*—Practice is affected by an understanding of the principles on which our practical measures are based. We may well, therefore, consider for a moment the physiology of massage. It must not be imagined that massage acts merely by supplying to the heart muscle a stimulus to contraction. It is doubtful whether the process acts in this way at all.[3] What proper cardiac massage does is to supply enough rhythmical compression of the heart to expel the contents of both ventricles. Thus an artificial circulation is set up. It is on the recovery of this circulation—and especially circulation through the coronary arteries—that re-institution of the spontaneous heart-beat and the respirations really depends. It is important in practice to realize that heart stoppage during anæsthesia is generally one of two kinds. In the less dangerous the breathing fails first, and some contraction of the heart continues even after the pulse is imperceptible. In the other kind there is sudden failure of the heart, and the breathing may go on intermittently for a little while after all circulation has ceased. The ventricle of the heart in these cases is in a state of fibrillation. It is in them that speedy action is important, and, experimentally at any rate, there appears to be little chance of recovery if massage is delayed more than five minutes. Obviously it is most undesirable that so formidable a measure as opening the abdomen and massaging the heart should be resorted to unnecessarily. It is equally obvious that when this is really needed it must not be too long delayed. The anæsthetist, therefore, must rapidly determine whether or not he believes the patient to be suffering from fibrillation of the ventricles rather than from the more gradual failure due to overdose. According to his decision must he hasten or delay the use of cardiac massage. The method may occasionally have been employed when recovery would have occurred without it. On the other hand, many cases in which no recovery was obtained might have ended successfully had the massage been applied earlier.

If continued rhythmic compression is not successful, and no beat of the heart occurs within five minutes, it must be intermitted. Intervals of half a minute must be allowed, and then the compressions resumed for two minutes, another interval permitted, and so on. Levy states[3] that massage should be continued as long as one hour before abandoning the case. He also says that if the circulation is feeble after recovery, an intravenous injection of **Pituitrin** is desirable.

This leads us to the question of **Injection of Drugs** in the treatment of heart failure. In older times almost the first resort was to hypodermic injection of ether, strychnine, or brandy. It is plain that if the circulation has ceased such injections can have no effect at all. The only injection likely to help is one into the heart muscle itself, or one so made into a vein that the injected drug reaches the heart. Thus Henschen[4] claims to have restarted a heart by injecting **Epinephrin** into its substance even after massage had failed, and Crile has shown that **Adrenalin** injected into the wall or cavity of the heart can cause contraction. Cranston Walker[5] has had a success in practice with this method, and, since it can be rapidly and easily tried without doing harm, it may well precede cardiac massage. On experimental grounds Mummery[6] believes the most efficient method to be infusion into a vein of **Saline Solution** with 1–50,000 **Adrenalin.** He states that the heart is thus automatically stimulated by distention of the right auricle. Presumably, therefore, a vein in the neck or an arm must be selected in order to give the solution a good chance of reaching the auricle when the circulation is at a standstill. When the heart has been restarted, whether by massage or other means, an intramuscular or intravenous injection of pituitrin may be of service. Generally speaking, when the anæsthetist has to treat syncope during anæsthesia, he is wise to disregard drugs and devote his whole attention to the measures of artificial respiration, etc., detailed above, and to originating, or if necessary performing, cardiac massage at the proper time. (*See also* HEART, SURGERY OF.)

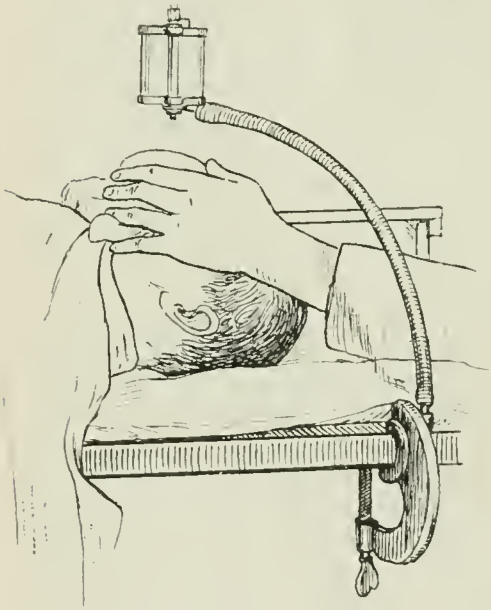


*Fig.* 4.—Odén's apparatus for administering ether, attached to operating table.

One of the chief factors in successful administration of **Open Ether** is continuous administration of a level amount when anæsthesia has been reached. This is rather laboriously achieved by ordinary drop methods, and the apparatus devised by C. L. A. Odén,[7] which we illustrate (*Fig.* 4), should prove a great convenience to the administrator, as well as leaving him more free for the observation of his patient.

An apparatus which allows of the constant delivery of an *accurately measured percentage ether vapour* has hitherto been wanting. There is, of course, not the same necessity for accurate control of the vapour strength in the case of ether as there is with chloroform, for which drug various forms of regulating apparatus have long been in use. A. H. Miller[8] describes a constant temperature ether vaporizer from which he claims to obtain an ether vapour diluted with air to any desired percentage. The apparatus is very economical in its consumption of liquid ether, using only four ounces during the first hour of anæsthesia.

The employment of **Preliminary Injections** to aid anæsthesia and diminish after-effects appears in some quarters in America to be overshadowing the mere administration of the anæsthetic. The important influence on the patient is being, in fact, brought about before he even reaches the operating theatre. Here merely unconsciousness and analgesia is demanded of the anæsthetist. As with all new methods, triumphant results are already claimed for this 'synergistic analgesia'. Relaxation is perfect and after-effects are negligible. It is impossible to believe, however, that the numerous injections required are not a detriment to the method, or that it is a matter of no consequence that so large an amount as 300 or 400 c.c. of 4 per cent magnesium sulphate has to be run in beneath the skin of the breast. Since, however, it is impossible to determine the value or worthlessness of any method without giving it a trial, our readers may note the details of the technique.[9]

"Two soap-suds enemata, one hour apart, or one followed by a thorough irrigation until the return is clear, are given the night before operation. A tap-water enema is given early the next morning. If not already in place, a folded sheet is placed under the patient to serve as a lifter at the proper time. The bed is now screened, if in a ward, or the room darkened, and quiet demanded. Two hours before the operation a **Chloretone Suppository,** gr. xv, is given, after which the patient is not allowed to leave his bed. Half an hour later a breast hypodermoclysis is given of 300 or 400 c.c. of a sterile and chemically pure 4 per cent solution of **Magnesium Sulphate** at a temperature of 110°. In one or two instances we have dissolved one tablet of **Novocain Suprarenin** in the solution, and this seemed to allay the small amount of pain caused by the distention of the tissues. The whole procedure should be done aseptically, the solution running in by gravity in not less than thirty minutes. We have had no abscesses or sloughs. A towel is now placed over the face, and every inducement is offered for sleep. The first hypodermic of **Morphine** is given one and a half hours before the time set for the operation, and consists of $\frac{1}{8}$ gr. It may be given in plain water or in magnesium sulphate. This is repeated at fifteen- or twenty-minute intervals, until the full amount is given, the average adult receiving $\frac{3}{8}$ gr. If an idiosyncrasy is present, it will develop before the time for the third dose. Often $\frac{1}{4}$ gr. is amply sufficient, especially for women. At the proper time the patient should be lifted as gently and quietly as possible and placed upon the stretcher, or preferably upon the operating table, and taken to the operating room. Under no circumstances shall he be allowed to help himself. When these precautions are taken he will arrive in the operating room in a quiet and comfortable mood and quite often asleep. If asleep, he is probably analgesic, and in one or two instances the operation has been done by using **Novocain** for the skin and peritoneum. However, the best results have been obtained by using **Nitrous Oxide and Oxygen.** This factor may be considered as representing the margin of safety with this special technique, as it can be withdrawn at any time, leaving the patient analgesic, but usually not unconscious. It is best to apply the mask before the usual preparation for the operation begins, as the gases themselves add considerably to the analgesia. With the mask in place, the oxygen is started at the same time as the nitrous oxide, and at no time should the patient be cyanosed or any attempt made to induce the usual signs of anæsthesia."

Gwathmey, whose account we have given, states that after skin and peritoneum are incised, oxygen may be rapidly increased up to 35 per cent. According to this authority, the appearance of the patient is so much more satisfactory that "one feels fully compensated for the extra time and care taken in the preparation, and the patient's condition after the operation fully justifies every procedure". Shock, even after decortication of a lung, pylorectomy, and other severe measures, "is almost invariably absent". Patients are said to be comfortable for fifteen to thirty hours after operation, with no wound pain, nausea, or vomiting.

A simpler technique, merely three separate injections of **Morphia** in 25 per cent solution of **Magnesium Sulphate,** is described for minor operations in which no great relaxation is required. Another modification of the method is to employ a **Colonic Ether Injection** beforehand, and thus, in most cases, entirely do away with the necessity for any inhalation anæsthesia on the table.[10]

Anæsthesia with **Nitrous Oxide under Pressure**[11] has been experimentally investigated by Leonard Hill and Dale. They conclude that cats at any rate can be put into a state of excellent anæsthesia by mixtures of the gases containing enough oxygen to prevent all asphyxia, provided that the mixture is inhaled under pressure. Without the pressure, anæsthesia could only be obtained by mixtures so poor in oxygen as to be asphyxial. In human practice, the common difficulty with 'gas oxygen' is that, if enough oxygen is used to preserve good colour, relaxation cannot be adequately obtained without the addition of ether or the like. The authors suggest that, in an operating room built as a pressure chamber, perfect anæsthesia would be obtained by 'gas and oxygen' only.

Yandell Henderson[12] gives a further elaboration of his views on *acapnia* and *alkali deficiency of the blood* during anæsthesia. If his explanation of the depression that sometimes follows long inhalations of ether is right, his remedy seems perfectly logical. This is administration of **Carbon Dioxide** during the recovery period; and he promises an inhalation device by means of which any desired amount of carbon dioxide may be administered to a patient, mixed with the inspired air, but with no appreciable degree of re-breathing which would impede the elimination of ether.

In an instructive article on the *heat losses* of the body connected with surgical operations under ether anæsthesia, C. G. Corlette[13] shows how, as regards heat loss by respiration, the moistening of inhaled vapours is more important than the mere warming of them. In many cases, he says, the paradoxical result is reached that the anæsthetist, who with the best intention is supplying warmed air and warmed ether, is causing more heat loss to the patient than if he delivered ordinary room air and cold ether. Much information is given with regard to the efficiency of various methods of preserving body heat during operation. Blankets are commended. With regard to the ordinary ways of applying warmed ether vapour, the writer remarks that they are in truth something more than a mere warmed ether system. They function as regulators of ether content in the air supplied, and, what is more important, are associated with a plenum system of aerating the respiratory organs. "The warming of the ether = a decorative trifle".

J. R. Mackenzie and G. H. Colt[14] raise the question of keeping the atmosphere of the operating theatre free from anæsthetic vapours. They suggest that the vapours should be generated outside the theatre, delivered to the face-piece through a wide tube, and removed by a similar channel. An experimental apparatus for applying the vapour through a tube and trapping the expirations is shown in *Fig. 5.*

McKesson[15] believes that by use of the *sphygmomanometer* during operation the onset of shock can be determined earlier and with greater certainty than by mere naked-eye observation of colour and palpation of the pulse. He describes three stages of circulatory depression; (1) A stage characterized by a small increase in pulse-rate without corresponding increase in systolic pressure, or a small decrease in blood-pressure without a decrease in pulse-rate. This is of prognostic value in estimating the patient's power of compensation when compared with the depressing influences applied to the patient just prior to its occurrence. (2) A stage characterized by increase in pulse-rate and decrease in blood-pressure amounting to 25 per cent or more of each. This is regarded as the signal for the anæsthetist to have restorative measures ready should the stage develop into the third. (3) Here there is further depression, an increasing pulse-rate above 100, and decreasing blood-pressure below systolic of 80 mm., with a pulse-pressure of 20 mm. or less. This is the condition of the circulation when the classical signs of shock become manifest. If the third stage is allowed to continue more than twenty to thirty minutes, few patients recover. The best prophylaxis in McKesson's opinion is **Intravenous Saline Infusion.** The systolic pressure must be brought up to within 10 to 15 mm. of the patient's normal blood-pressure, and kept there by slow additions of the saline solution. The quantity to be administered must be determined by the sphygmomanometer.

G. W. Crile[16] describes a "further advance in anociation". This is the combination of a state short of anæsthesia, produced by nitrous oxide and oxygen, with local analgesia from injection. From the description it appears that when pain is evinced the inhalation anæsthetic is pushed momentarily to the point of true anæsthesia. The results appear to have been highly satisfactory from the point of view of safety, but it is difficult to see how the condition maintained can be anything but inconvenient to the operator.

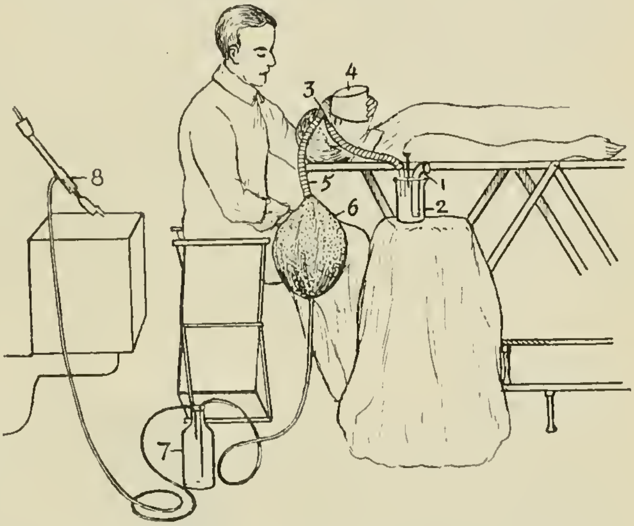


*Fig.* 5.—Device for keeping atmosphere of operating theatre free from anæsthetic vapours. (1) Air inlet; (2) Ether supply; (3) Flexible connection to mask; (4) Mask; (5) Flexible connection to bag; (6) Equalizing bag; (7) Wash-bottle; (8) Filter pump with tap union.

*Regional Anæsthesia* is carried out by Fidel Pagés[17] by blocking the nerve roots in the epidural space. The injection is made at the spinous process corresponding to the region to be operated on. For example, for operations on the stomach, which is innervated by the sixth to the twelfth dorsal roots, the spinous process of the eighth dorsal is selected. An injection at this level blocks the sixth to twelfth roots. The needle is inserted 1 to 1½ cm. outside the process, and directed forward to the yellow ligament about 12 cm. from the skin. After this ligament is passed, the anæsthetic is injected. From 20 to 25 c.c. of 2 per cent **Novocain** with **Adrenalin** is the solution employed. The anæsthesia lasts for at least an hour and a half.

Robert Emmett[18] pleads for simplicity of technique in obtaining local anæsthesia. His condemnation of multiple punctures is undoubtedly justified. It is a paradox in action to hurt a patient with numerous pricks in order to save him from being hurt. Herein lies the weakness of paravertebral injection for thoracotomy. Emmett claims that by using long flexible needles large areas can be infiltrated through a single wheal. H. Aboulker[19] colours his solution for local anæsthesia with methylene blue. By operating only through stained areas he ensures the avoidance of pain.

*Spinal Anæsthesia.*—For the treatment of collapse after intrathecal injection, Bloch and Hertz[20] inject 10 to 25 cgrm. of **Caffeine** into the theca, rolling the patient for the purpose into a lateral position. Labat[21] recommends 1 cgrm. of novocain for every 15 lb. body-weight of patient.

*Sacral Anæsthesia*, which has come lately into much increased use, has been accompanied by a large mortality. Zweifel[22] discusses ten deaths, three of which appeared to be due directly to the injection.

*Paravertebral Conduction Anæsthesia* in the neck has several times been associated with convulsions which have more than once proved fatal. They have been attributed to hæmatoma in the neighbourhood of the vagus.[23]

For an account of **Butyn**,[24] a new synthetic local anæsthetic, *see under* EYE, GENERAL THERAPEUTICS OF.

*Accidents with local anæsthetics*[25] are related by Wiedhoff, who produces a formidable list, including 14 deaths ascribed to novocain. Two were with paravertebral anæsthesia for goitre, and some were under high sacral anæsthesia.

REFERENCES.—[1]*Lancet*, 1919, ii, 602 ; [2]*Ind. Med. Gaz.* 1919. Feb., 50; [3]*Lancet*, 1921, ii, 949 ; [4]*Jour. Amer. Med. Assoc.* 1920, June 5, 1610 ; [5]*Brit. Med. Jour.* 1921, Jan. 8 ; [6]*Ibid.* Jan. 15 : [7]*Jour. Amer. Med. Assoc.* 1922, March 18, 803 ; [8]*Ibid.* 1921, Aug. 6, 433 ; [9]*Med. Record*, 1921, Oct. 1, 583 ; [10]*Jour. Amer. Med. Assoc.* 1922, Jan. 7, 24 ; [11]*Lancet*, 1921, ii, 326 ; [12]*Jour. Amer. Med. Assoc.* 1921, Aug. 6, 424 ; [13]*Med. Jour. of Australia*, 1921, Aug. 13 ; [14]*Brit. Med. Jour.* 1921, ii, 938 ; [15]*Jour. Amer. Med. Assoc.* 1921, Aug. 6, 430 ; [16]*Surg. Gynecol. and Obst.* 1921. July, 74 ; [17]*Ibid.* Aug., 91 ; [18]*Med. Record*, 1921, July 30. 179 : [19]*Presse méd.* 1921, Oct. 26, 854 ; [20]*Ibid.* July 2 ; [21]*Ann. of Surg.* 192, Dec., 673 ; [22]*Med. Science*, 1921, Sept. 525 ; [23]*Surg. Gynecol. and Obst.* 1921, Dec., 443 ; [24]*Jour. Amer. Med. Assoc.* 1922, Feb. 4, 343 ; [25]*Ibid.* Feb. 18, 552.

## ANEURYSM.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Aneurysm of the Innominate Artery.**—Ballance[1] points out that there are cases of innominate aneurysm which are suitable for proximal ligature, and states that all the cases recorded in his communication—except his own—are of ligature of the innominate for subclavian or carotid aneurysm. The common site of aneurysm of the innominate artery is at its bifurcation ; the proximal part of the artery is often not dilated, or only slightly so.

His technique was as follows : Skin flaps were raised so as to give a wide exposure of the manubrium and inner end of the clavicle. The sternomastoid origins were detached, as were also the sternohyoid and sternothyroid muscles. The inner extremity of the left clavicle was removed, then the cartilage of the first rib was cut through close to the manubrium. The manubrium was sawn across and removed as shown in *Plate IX, A.*

The edges of the pleura were pressed away with gauze ; the left innominate vein and the upper border of the arch of the aorta were brought into view. It was not difficult to expose the innominate artery below the aneurysm. The artery was tied with two strands of kangaroo tendon ; pulsation in the aneurysm ceased at once. The wound healed without trouble. The right arm was useless at first ; no pulse was present in any artery of the upper extremity.

Three years later the patient was seen. The aneurysm had disappeared but for a small hard mass, and the radial pulse at the wrist did not appear to differ from the left radial pulse. The patient died about three and a half years after operation. The immediate cause of death was a large infarct in the lung. The autopsy showed the artery obstructed at the site of ligature. The aneurysm had disappeared—its remains were in the fibrous mass representing the distal portion of the innominate artery (*Plate IX, B*).

**Subclavian Aneurysm with Cervical Rib.**—Moore[2] describes a case, and

# PLATE IX.

## LIGATION OF THE INNOMINATE ARTERY FOR INNOMINATE ANEURYSM

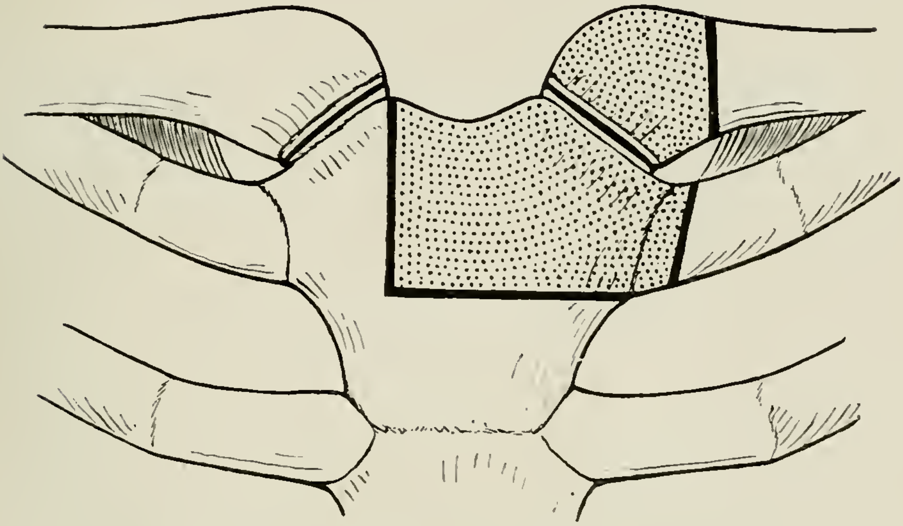


*Fig. A.*—Showing portions of manubrium and clavicle removed.

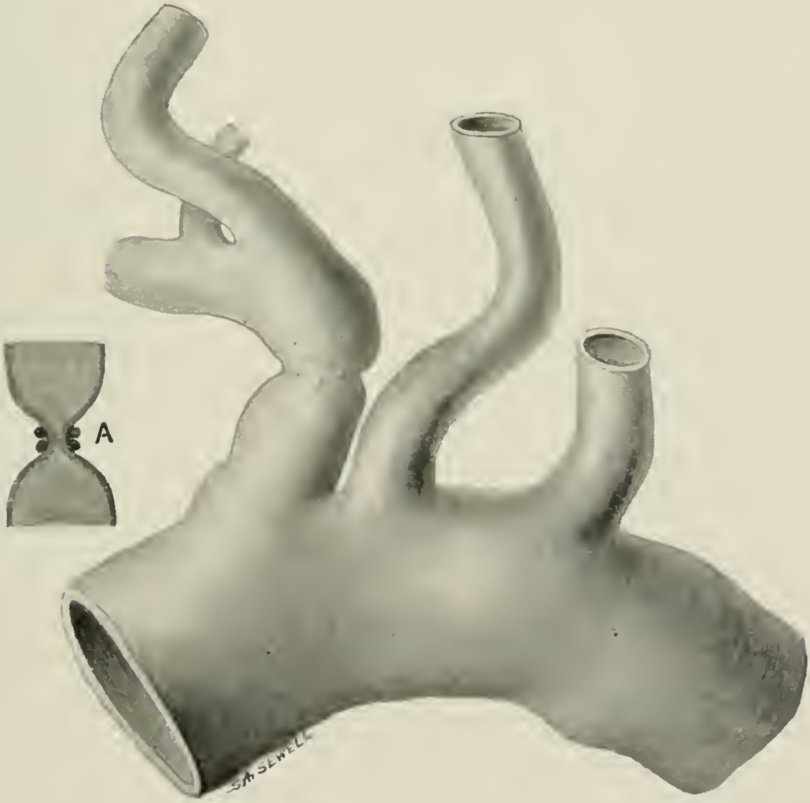


*Fig. B.*—Proximal ligation of innominate artery for aneurysm of the bifurcation. Completely cured. (A) Schema of method of ligation.

*By kind permission of the 'British Journal of Surgery'*

makes the following interesting comments: Here, then, was an undoubted case of subclavian aneurysm with a cervical rib. As to the causal connection between the two conditions, it is worth remarking that the aneurysm sprang from the front of the artery and not from the part in contact with the rib. The presence of a normal radial pulse seemed to indicate that there was no compression of the artery. In this connection, Halsted's experiments on the partial obstruction of arteries with aluminium bands are noteworthy. A prolonged search of the literature has revealed no case quite parallel with the above. Some cases, loosely called aneurysm in the early days, were normal arteries pushed up by the rib. Others revealed themselves as expanded arteries, which returned to normal calibre as soon as the rib was removed, as in Tubby's case, where the operator actually saw this occur before he closed the wound. In Murphy's case the sketch shows a well-developed aneurysm, but the author has stated that the artery was merely flattened and spread out, the appearance of it being much exaggerated by the artist. Keen had a case in which the calibre of the artery, beyond the edge of the scalene muscle, was twice its normal size. He doubted if any of the recorded cases were genuine aneurysms, and remarked, "In no case has the vessel been ligated; a very wise abstinence". In Ehrich's case the aneurysm developed after the removal of the rib, which he attributed to the effect on the arterial wall of the loss of support. Perhaps the most convincing case is that of Adams. The patient came under treatment in 1836 for some eye trouble, and was noticed to have a pulsating swelling above the left clavicle, and a hard swelling to its inner side. A diagnosis of aneurysm with cervical rib was made, and many consultations were held as to the advisability of operation. Three years later the patient died of pneumonia, and a fusiform aneurysm 3 in. long was found, starting beyond the edge of the scalenus anticus. There was a double cervical rib and no visible disease of the arterial wall.

It will be noted that in every case the dilatation was distal to the rib, so obstruction to the circulation apparently played no part in the causation. In the case under review the wall of the sac was thin and the swelling increasing in size; to all appearance rupture of the sac at no distant date must have occurred. On the general question of the necessity for operation in cases of cervical rib, it is noteworthy that, so far as published cases go, the mortality of operations is nil. On the other hand, cases have been described by Sherren and others where the operation caused trouble from nerve involvement in the scar, and by Thorburn where a troublesome sinus, not due to sepsis, formed some time afterwards, and remained in one case as long as eighteen months. To anyone in search of information on any subject connected with cervical ribs, the exhaustive bibliography collected by Honeij may be recommended.

**Carotid Aneurysm** (*see also* VASCULAR SURGERY).—Winslow[3] comments on the rarity of aneurysm of the *internal carotid in its cervical portion.* The practical interest of this condition is the liability of its being mistaken for tonsillar abscess. He quotes several dramatic cases where the mistake was made by eminent surgeons. He says that failure to resort to digital examination when possible is inexcusable: "Rely upon touch as your sheet anchor, and mistakes will be reduced to a minimum". He concludes: (1) Aneurysm of the cervical portion of the internal carotid artery is not as infrequent as supposed. (2) Before incising a unilateral lump in the neighbourhood of the tonsil, especially if of long standing, look, feel, listen. (3) Spontaneous cure may occur, but the usual termination in untreated cases is death from rupture into the fauces. (4) The operation of choice is occlusion of the internal carotid proximal to the sac. If this be impossible, ligation of the common carotid artery, together with a ligation of the external carotid, between its origin and first branch. If the external carotid be tied distal to a branch, that branch must likewise be occluded. (5) After ligation the prognosis is fair both as regards operative recovery and permanent cure. (6) Aneurysm in other localities is by far more prevalent in the male than in the female; in the internal carotid it occurs in almost an equal ratio in the two sexes, being slightly more prevalent in the male if all types are considered, but much more frequent in the female in the spontaneous variety.

Dobrovolskaya[4] describes a *method of exposing the supra- and infraclavicular regions.* The incision starts in the middle of the neck between the two heads of the sternomastoid muscle, and runs downwards to the sternoclavicular joint, which it surrounds in a semicircle, and proceeds along the lower border of the clavicle, where it is carried right down to the bone. The periosteum of the inferior and posterior surfaces of the clavicle is carefully separated with the raspatory, and the sternal end of the clavicle disarticulated. Strong retraction brings the subclavian vessels and the brachial plexus within easy reach.

Blair[5] says that it was a teaching of Cooper that to tie the common carotid artery in a person past middle life was always dangerous, and in the arteriosclerotic equivalent to a death warrant. He deals with the question of *secondary hæmorrhage from the branches of the common carotid artery,* and concludes: (1) That secondary hæmorrhage of the carotid artery and its branches is to be prevented by not suturing wounds that extend through the floor of the mouth, and by packing or freely draining all wounds in the neck, above the level of the thyroid cartilage, that contain a ligated primary branch of the carotid artery. (2) That secondary hæmorrhage from a ligated primary branch might possibly be controlled by previously having placed the ligature as far from the carotid as possible; and when bleeding actually occurs: (*a*) To free the stump from the surrounding indurated tissues; (*b*) To ligate any branches that are given off proximal to this ligature, and, if necessary, to loosely re-ligate the stump itself as far from its origin as possible.

If it is found necessary to place the ligature on the bleeding stump so close to the external carotid as to preclude the formation of a proximal clot, then the external carotid itself should be exposed and a ligature placed on each branch and on the trunk at least an inch from the bifurcation, in the hope of establishing a permanent clot in the external carotid itself. In this latter fashion he has successfuly avoided ligating the external carotid dangerously close to its origin in a wound he knew would become infected.

Freeman[6] also calls attention to the dangers to the brain in ligating the common carotid. The percentage of cases in which the brain is affected has been placed as high as 54·5 (Lefort). The almost universally accepted cause is anæmia with softening of the brain. Freeman does not accept the idea, and says that scant attention has been given to the objections to this time-honoured theory. It fails to explain: (1) The interval which nearly always occurs between the operation and the advent of cerebral symptoms, which varies from a few hours to several days, or even two or three weeks. If anæmia were the cause, symptoms should occur at once. (2) The *suddenness* of the onset of the symptoms. If produced by anæmia, they should come gradually. (3) The greater frequency of brain complications in ligation of the common over that of the internal carotid. Theoretically, it should be the reverse, owing to the possibility of a retrograde flow of blood from the external carotid. This, in fact, has actually been observed to occur in certain operations in the neck. (4) Autopsies in which no arterial sclerosis and no deficiencies in the circle of Willis have been found (Zimmermann). (5) Cases in which the artery was temporarily compressed for a long time before operating, without ill effect, with disaster resulting after ligation (Goldhammer).

(6) Cases in which a preliminary, gradually increasing constriction of the lumen by metal bands was resorted to, and still cerebral softening followed permanent tying of the vessel (Gruber and Werner). (7) A case (Perthes) where the common carotid was temporarily tied during the extirpation of a cervical tumour; but as soon as the ligature was divided and the *circulation* re-established, hemiplegia followed, which cannot be explained by anæmia.

Another explanation for softening of the brain following ligation of the common carotid was advanced by Zimmermann, in 1892, and supported more recently by Stierlin, Perthes, and a few other observers. Although receiving scant recognition, it has much in its favour and deserves serious consideration. It is based upon the fact that when the carotid is tied its inner coat is ruptured, which leads to the formation of a thrombus; and it is either the direct extension of this thrombus, or much more frequently the lodgement of detached emboli, which may block the cerebral arteries and cause anæmia and softening. Rarely, when the intima is smoothly divided, thrombosis does not result; but where the edges are ragged or curl into the lumen of the vessel, coagulation is inevitable.

The points in favour of this theory are numerous and convincing. It explains, for instance, why: (1) There is nearly always an interval between the operation and the cerebral disturbances, during which a clot is formed and emboli are detached. (2) The brain symptoms come suddenly, like an apoplectic stroke, due to the lodgement of emboli. (3) Autopsies done in fatal cases following ligation, and also experiments upon animals, have repeatedly demonstrated the presence of ascending thrombosis and of embolism. (4) Tentative compression or temporary ligation, even when unaccompanied by symptoms, does not ensure that disaster will not result when the artery is permanently tied, and neither does the gradual diminution of the arterial calibre by metal bands or otherwise. (5) Disaster is more frequent in ligating the common than the internal carotid, because the return flow from the external carotid is particularly liable to detach emboli from an extending thrombus in the main arterial trunk. (6) The release of a temporary ligature, with *re-establishment* of the circulation, may initiate cerebral trouble, as demonstrated by Perthes.

*Summary*: (1) The great danger from cerebral disturbances in ligating the common carotid artery is universally recognized. (2) The accepted theory in accounting for this danger is that of anæmia, due to failure of collateral circulation arising from defects in the circle of Willis. (3) An apparently more rational theory, recently emphasized by Perthes, is that of thrombosis at the point of ligation, followed by embolism. This accounts for the suddenness of onset of the symptoms and the greater or less interval which precedes them. The preponderance of cases after middle life is explained by the greater brittleness of the inner coat of the artery producing ragged edges when divided by the ligature, and thus inviting thrombosis. (4) If this latter theory can be substantiated by experience, it will do away with much of the fear and hesitation of the surgeon when confronted by this comparatively simple operation. [Ligature of the common carotid in a child is free from danger. The artery on the other side may be ligated after an interval of three weeks in certain cases of hydrocephalus.—W. I. de C. W.]

**Aneurysm of the Vertebral Artery.**—Aneurysm of the larger arteries of the brain is a rare condition. They seldom attain a size larger than a walnut, and frequently lead to fatal rupture when no larger than a pea. The middle cerebrals and the basilar are more often affected than the other vessels. Morrow[7] discusses aneurysm of the vertebral arteries. A great variety of disorders may follow; the medulla is subjected to a severe pressure test; the pressure may extend to the pons and produce a large notch on its exposed surface. Morrow gives the following conclusions :—

The diagnosis of cerebral aneurysm, Finley states, is seldom if ever made with certainty. In Beadles' 555 cases, apoplexy was the first symptom in 46·3 per cent. Here the aneurysms are chiefly of the miliary type and are confined to the smaller vessels of the brain. The characteristic murmur indicating an aneurysm of one of the larger arteries is seldom heard. Diagnosis based upon a murmur, according to Beadles, has been proved correct in only two instances by post-mortem findings.

It would seem therefore that the chief point upon which to base a diagnosis is a pressure manifested by the symptoms it produces. With an aneurysmal dilatation of either of the vertebral arteries the possibilities of hearing the characteristic murmur would be greater, because of their more superficial position, than when the other arteries of the brain are similarly affected. The disappearance of the murmur by pressure on the vertebrals where they pass through the foramina of the lateral processes of the sixth cervical vertebra would be of value in making the diagnosis. When the aneurysm has undergone a spontaneous cure, even this means of diagnosis must disappear. Unfortunately the seriousness of the condition may be recognized too late, after perhaps irreparable damage has been done, in which event any surgical interference would be of little or no value. Even with a grave prognosis, the institution of proper medical treatment and certain hygienic measures may temporarily alleviate the patient's condition. Hence, the earlier the recognition of the presence of a vertebral aneurysm the greater will be the chances for a prolongation of the patient's life, or perhaps even a cure.

Let it be suggested that the possibility of a cure of a vertebral aneurysm by ligation of the artery presents itself. The point of choice for its ligation is through the suboccipital triangle of the neck. In 36 ligations of the vertebral artery there were 3 deaths (Jos. D. Bryant).

*Summary* : (1) Aneurysmal dilatation of the vertebral arteries is a very rare condition. (2) The medulla oblongata and many of the cranial nerves are damaged by the aneurysm, as is manifested by the resulting compression bulbar paralysis. (3) A correct diagnosis of vertebral aneurysm is difficult to make, and it is likely to be made late in the progress of the disease. (4) The treatment before the aneurysm has undergone a spontaneous cure is surgical, and symptomatic in the later stages of bulbar paralysis. (5) The earlier the diagnosis of vertebral aneurysm, the more favourable will be the prognosis. In any event the prognosis must be considered grave.

**Aneurysm of the Abdominal Aorta.**—Vaughan[8] states that the abdominal aorta has been ligated nineteen times, but without success. He describes a case still living and working one year and four months after operation. Halstead's principle of incomplete occlusion of the lumen of the vessel was adopted, using a piece of tape instead of metal bands. The aneurysm, about 1½ in. in diameter, sprang from the left side of the aorta opposite the origin of the superior mesenteric artery. The ligature was placed below the aneurysm according to the Brasdor method. The peritoneum was opened, the aorta exposed, and a piece of cotton tape one half-inch wide was carried round the vessel about two inches above its bifurcation and just below the origin of the inferior mesenteric artery. Two turns of one end of the tape made the surgeon's, or friction, knot, which was drawn gradually tighter and tighter until pulsation was no longer perceptible in the iliacs, and barely so in the aorta below the ligature; the knot was completed, the ends of the tape were cut, and the abdomen was closed. Next day the patient's condition was satisfactory ; the pulse could be felt in the left foot, but none in the right;

both were equally warm and comfortable. About five months afterwards the aneurysm seemed about half its original size. One year and twenty-one days after the operation he was hard at work and looking well; no aneurysmal pulsation could be felt, but a murmur could be heard over the original site.

In connection with the operative treatment of abdominal aneurysm, it must be recollected that good results have been obtained in recent years by the introduction of wire, as suggested by Colt. The old dangers of passing a wire through a cannula with the uncertainty of where the end of the wire would travel, does not exist with the modern apparatus. In August, 1910, the reviewer[9] introduced a wire cage of 150 inches into a large pear-shaped abdominal aneurysm arising from the aorta in the region of the cœliac axis. The patient, in August, 1922, twelve years after operation, was well, and working as an employee in a Dublin brewery. Compared with the results of ligature of the abdominal aorta, including Halstead's method of partial occlusion with metal bands, the operation of wiring by modern methods seems infinitely more safe. (*See also* ANEURYSM, AORTIC.) Matas' operation has been tried on the abdominal aorta, with failure. Astley Cooper did the first operation 104 years ago.

**Arteriovenous Aneurysm.**—Floyd[10] describes cases of *mycotic embolic arteriovenous aneurysm of the femoral vessels.* Tuffnell, in 1853, definitely recognized the dependence of an aneurysm on emboli derived from vegetations on the heart valves. Probably the inflammation begins in the artery wall where the thrombus lies in contact with it, and progresses from the lumen outwards. Aneurysms can occur with acute endocarditis in another way: vegetations may form on the aortic wall, especially in the ascending aorta, just as they form on the valves; the vessel wall beneath them may be ulcerated and weakened, and may pouch into sacculated aneurysms which are mycotic but not embolic. Heretofore arteriovenous aneurysm has been associated with simultaneous penetration of artery and vein by a weapon or projectile.

Floyd can only find two cases of embolic mycotic arteriovenous aneurysm. He describes the autopsy on a patient who died eleven weeks after coming to the hospital, and five months after the appearance of his initial symptoms of swelling of the right leg. The heart showed distinct but not extreme enlargement of the cavities of both ventricles, with decided thickening of their walls. The valves of the right side were normal. The mitral valve had huge vegetations of yellow fibrin, with recent bloody deposits on both cusps, and there was considerable ulceration with loss of substance of the cusp edges. The aortic valve had a fibrin vegetation 3 mm. in diameter and 1 cm. long on one flap, which was inflamed and penetrated at the point of attachment of the vegetation; another aortic cusp bore a small recent vegetation, while the third was normal. There was a small mural vegetation on the ventricular endocardium well below the mitral orifice. There was a large sacculated aneurysm springing from the posterior surface of the right femoral artery in Scarpa's triangle, by an orifice elongated in the axis of the vessel, 2·5 cm. long and about 0·7 cm. wide, with smooth edges. The femoral vein lay on the front wall of the sac, and there was an opening from the vein into the sac, also elongated in the axis of the vessel, 5 cm. long. Its edges also were mostly smooth. Thus the openings from artery and vein into the sac lay parallel and side by side, the venous opening having the greater vertical extent. The sac was 15 cm. long and over 6 cm. in diameter. It extended up behind Poupart's ligament into the iliac fossa, and the ilium was so deeply eroded beneath it that the acetabulum was opened and the head of the femur lay against the sac. The femur, however, showed no erosion.

J. F. Connors[11] describes an operation for the treatment of arteriovenous aneurysm designed to save the artery in cases where both artery and vein cannot be restored. The aneurysm is exposed and freed as far as possible from the surrounding tissues. A clamp is then placed on the artery at some distance from the connection with the vein, care being taken not to injure the intima, sufficient pressure being used to stop the arterial flow (*Fig.* 6). The vein is then ligated above and below the point of connection. If there are any small branches leading into the venous sac, these are tied off. The vein is now split longitudinally, making a narrow and a wider flap (*Fig.* 7). The opening is then exposed and closed by suture, care being taken to avoid the infolding of its coats. The suture material used is fine paraffined silk threaded on a flat needle. The knots are tied on the venous side, guarding against any narrowing of the lumen. When the suturing is completed, the clamp is gradually released and the amount of bleeding observed. In the beginning, bleeding may appear alarming; but gentle pressure with a hot pad will control it, as a rule, though it may be necessary to add one or more sutures. When the bleeding is controlled, the narrower flap (*Fig.* 8, A) is folded over the suture line. Flap B is then folded over flap A. No sutures are used to hold these flaps in position. The field is then covered with fascia, thereby causing the suture line to be covered by flaps A and B and a layer of fascia.

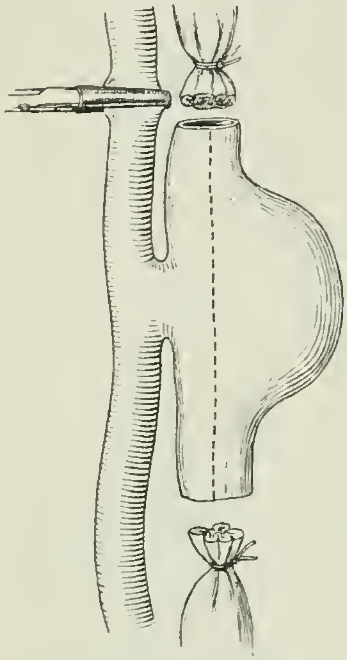


*Fig.* 6.—Connors' operation for arteriovenous aneurysm. Clamp applied to artery, and the vein ligated above and below the connection; dotted line, longitudinal division of vein.

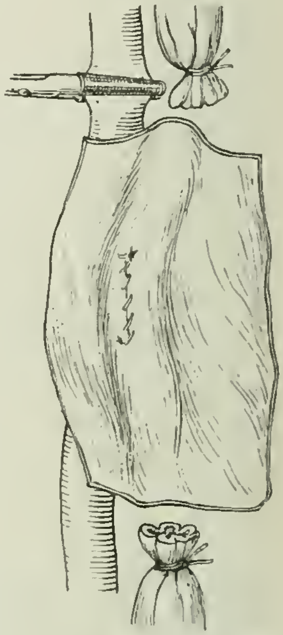


*Fig.* 7.—Vein opened, exposing the arterial connection, which has been sutured.

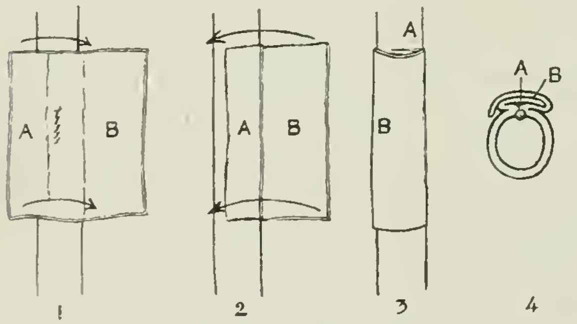


*Fig.* 8.—1, Suture completed; 2, Narrow flap, A, placed over suture line; 3, Wider flap, B. folded over narrower flap; 4, Cross-section of operation completed.

The reviewer has had five cases of arteriovenous aneurysm in recent years, each case showing some special point of interest.

*Case* 1 was an officer wounded in 1915 by a bullet which passed cleanly through the junction of the lower with the upper two-thirds of the thigh in the neighbourhood of Hunter's canal. A well-marked arteriovenous aneurysm developed with a continuous thrill and a loud hissing murmur, widely transmitted, but most intense over the actual point of communication between the artery and the vein. The vessels were exposed; the femoral artery was dilated, the vein presented a well-marked thin-wall sac; the femoral artery and vein were ligatured above and below the aneurysm. There was no circulatory disturbance after operation; the collateral paths are evidently well established in such cases as a result of previous obstruction to the main circulation. Through the courtesy of the Director-General Army Medical Services, it was ascertained that two years later the patient developed enteric fever and pneumonia, with thrombosis of the right leg, afterwards spreading to the left leg. Three years after operation he was well and fit for general service. The records of this case, so far as the operation is concerned, indicate that the officer suffered no disability from the ligature of the femoral artery and vein.

In *Case* 2, in April, 1916, a similar operation was performed on a child, age 8, who received a bullet wound while playing in the street. Quadruple ligature about a month after the original injury, as in the previous case, was followed by complete cure without any circulatory disturbance.

In *Case* 3 there was an arteriovenous aneurysm of the posterior tibial vessels, in a man who received a shrapnel wound about a year previously. The well-marked thrill traceable to the inner side of the foot, the loud booming sound like distant bombardment, as heard through the stethoscope, and the venous engorgement below the injury, were characteristic of the condition. Quadruple ligature with excision was practised in this case. The patient suffered from no trouble or inconvenience afterwards.

*Cases* 4 and 5, wounded in 1918, developed arteriovenous aneurysm in the region of the subclavian artery above the inner third of the clavicle, and are at present under observation A diffuse thrill could be felt, and a murmur heard like the rushing of a train through a tunnel. One man suffers no inconvenience whatever; the other is recovering slowly from concomitant injury of the trunks of the brachial plexus, and he has developed neurasthenia as a result of the loud noise heard in his ear when he rests on the injured side.

The treatment of arteriovenous aneurysm should undoubtedly be operative when situated in the limbs, for the following reasons: (1) Spontaneous cure is rare, but has occurred more often in the upper extremity than elsewhere. (2) Sudden death may occur from heart failure or embolism. (3) Rupture and fatal hæmorrhage may occur. (4) Varicose veins, thrombosis, and œdema are common in the lower extremities. (5) Vascular tissue involved may take on a varied growth.

In the case of arteriovenous aneurysm of the subclavian vessels, the problem of treatment is a more difficult one. When no treatment is adopted, either no change or sudden death must be expected; but the condition is not incompatible with prolonged life. Operation is often attended with unforeseen difficulties, including hæmorrhage, and should only be undertaken for the relief of special symptoms in selected cases.

In arteriovenous aneurysm of the neck, the distal venous dilatation is not constant as it is in the extremities. In fact, the large veins of the neck are often flaccid, and the pressure in them is low or negative. The arterial blood entering these veins meets with little or no obstruction, the venous blood finding a ready escape into large communicating channels in which a negative pressure exists.

Callender[12] makes a very full study of arteriovenous fistula from an analysis of 447 cases. The study was made for Dr. Halstead, to determine the cause of the proximal dilatation of the artery which has been observed in a number of these cases, and which he believes occurs invariably. Many points of interest are emphasized. The ever-increasing dilatation of the vein about the fistulous communication is a most constant feature, and is due to the increased pressure in the veins produced by the passage in them of arterial blood. The increased pressure causes yielding of the wall of the vein, and its lumen enlarges. Hypertrophy of the muscular coat follows, and the increased vascular tension is thus supported. The expansion of the artery proximal to the fistula is not so easy to understand, and many theories are put forward. It is taken for granted that there is a lessened arterial pressure resulting from the deviation of blood through the fistula.

La Roque[13] draws attention to a case of a bullet wound in the femoral artery and vein successfully treated by ligation of the artery and vein and extirpation of the injured segment.

References.—[1]*Brit. Jour. Surg.* 1922, Jan., 438 ; [2]*Lancet*, 1922, i, 1045 ; [3]*Ann. of Surg.* 1922, June, 688 ; [4]*Lancet*, 1921, ii, 129 ; [5]*Ann. of Surg.* 1921, Sept., 313 ; [6]*Ibid.* 316 ; [7]*Med. Record*, 1921, Nov. 19, 894 ; [8]*Ann. of Surg.* 1921, Sept., 308 ; [9]*Brit. Med. Jour.* 1911 ; [10]*Surg. Gynecol. and Obst.* 1921, Nov., 560 ; [11]*Jour. Amer. Med. Assoc.* 1921, July 9, 118 ; [12]*Johns Hop. Hosp. Rep.* 1920, xix ; [13]*Ann. of Surg.* 1922, June, 705.

## ANEURYSM, AORTIC.

*Drs. C. Lian and Périsson.*

(*Translated by Carey F. Coombs, M.D., F.R.C.P.*)

Treatment.—The Moore-Corradi method, known in practice under the name of **Wiring**, consists in the introduction of a foreign body into the cavity in such a way as to promote clotting in the interior of that cavity.

Of three forms of apparatus designed for this purpose, that of Colt seems to D'Arcy Power[1] to be safest, combining a maximum of speed and asepsis with a minimum of damage to tissues. It consists of a trocar with its cannula, and of a wire cage or wisp. This is the foreign body to be introduced into the aneurysmal sac, and it consists of a number of fine wires, gilded with an irregular surface so as to accelerate coagulation. These wires are soldered together at one end and curved as shown in *Fig.* 9. This is introduced into a hollow tube in such a way that the wires are fixed within it like springs. The cages are made in several sizes by Messrs. Down Brothers, London, and for each case the size most nearly corresponding to the bulk of the aneurysm should be selected.

Before it is used, the apparatus must be carefully sterilized and thoroughly examined to see that it is working all right. The trocar and cannula are then introduced through the skin until the aneurysmal sac is just penetrated ; this is easily recognized by the spurting of blood through the cannula when the trocar is removed. The tube containing the frame is then fixed to the free end of the canal, and all that remains is to introduce the frame into the sac by means of the trocar. The trocar is then withdrawn. Later, the presence of the open wires within the sac may be verified by means of radioscopy.

Some writers advise that an electric current be passed through the wire to hasten clotting ; but this is a more delicate procedure. Moreover, it seems that the employment of coarsely gilded wire, with rough surface, such as is used in Colt's apparatus, should suffice to promote clotting and render the use of electricity superfluous.

Of immediate results, the most tangible is the sudden or rapid cessation of pain experienced by those who have suffered severely and continuously over longer or shorter periods. This relief of pain is explained by the cessation, or at least the diminution, of the aneurysmal pulsation which is observed to follow wiring.

As for the later results, they are difficult to sum up accurately. The use of the apparatus has not been employed in a sufficient number of cases. Further, most of the cases have been hospital patients, whom it is difficult to follow up for long periods. Thirdly, antisyphilitic treatment has been administered simultaneously. Some of the patients have been able to resume a relatively active life, and some have survived for long periods. But sometimes antisyphilitic treatment alone gives similar results.

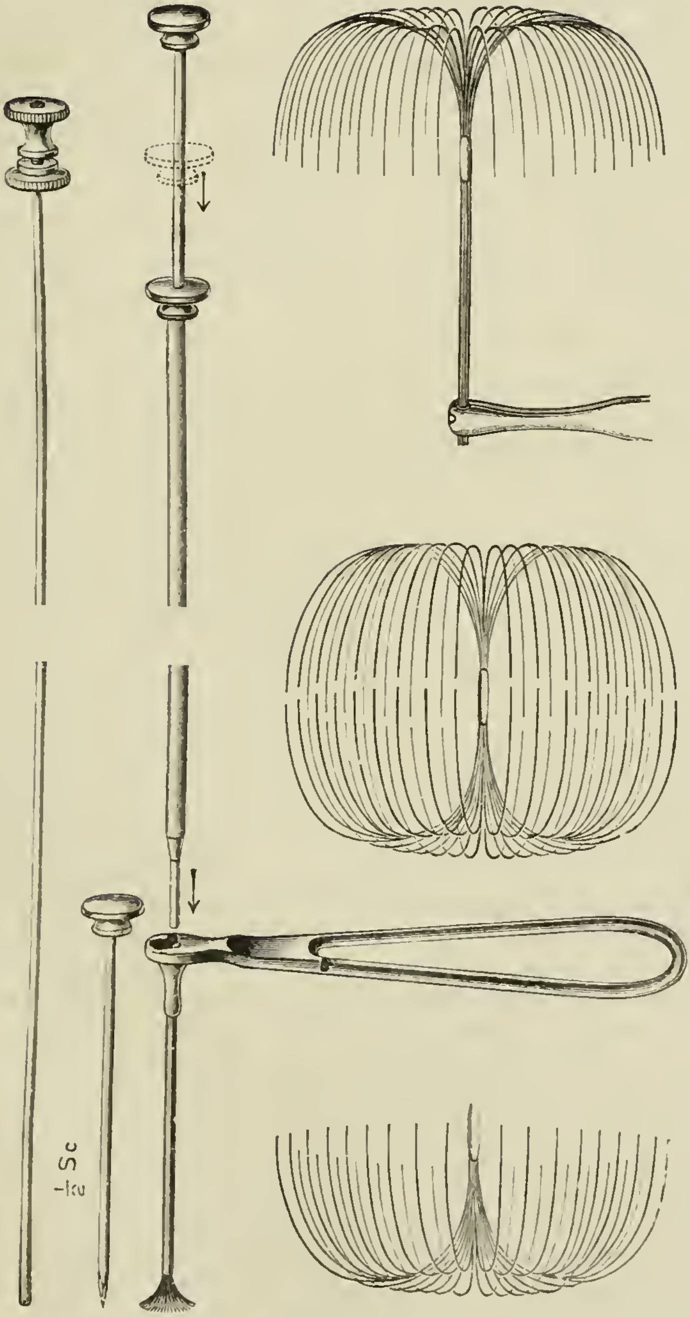


*Fig.* 9.—Mr. G. H. Colt's apparatus for wiring aneurysms.

To sum up, the most definite effect of wiring appears to us to be the relief of pain. It may therefore be indicated in cases of saccular aneurysm easily accessible and characterized by severe pain resisting treatment by antisyphilitic and other forms of medication.

But is the use of Colt's apparatus devoid of risk ? Many writers think that it is, if it is used with dexterity and coolness ; some indeed have abandoned all forms of anæsthesia, general or local. Nevertheless, we find it difficult to look on this proceeding as free from danger. In fact, we are unfavourably impressed by a whole series of unfortunate cases included even in the figures of D'Arcy Power, who panegyrizes the method. In eight of his sixteen observations death supervened in two to eleven days after operation. On the other hand, Joseph Sailer[2] remarks that " Hare has wired thirty-five cases without a single accident, and with almost uniformly good results ". Sixteen cases are quoted. He introduces a wire, of gold-platinum alloy, 26 feet in length, through a hollow tube. He passes an electric current through this wire, and considers the aid of an experienced electrotherapeutist to be indispensable.

References.—[1]*Brit. Jour. Surg.* 1921, July, 27 ; [2]*Therap. Gazette,* 1921, Oct., 694.

## ANKYLOSTOMIASIS. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Etiology.—W. W. Cort, D. L. Augustine, and G. C. Payne[1] report an investigation of the extent of migrations and the duration of life of hookworm larvæ in the soil, which indicates that most of them lose their sheath and are very definitely limited to the place of development, not migrating more than four inches, while under tropical conditions they rapidly decrease and completely die out within six weeks, so that with the elimination of further pollution of the soil the worm soon loses its infectivity. F. Rojas and J. T. Morengo[2] describe an uncinarial form of nephritis as the cause of the œdema and anasarca of ankylostomiasis, which is soon recovered from if the hookworms are removed by proper treatment. They demonstrated in nine cases chloride retention, and in three of them low urea excretion, and give careful records of their use of the methods of Ambard, Widal, and Weill.

Prophylaxis.—W. W. Cort and G. C. Payne,[3] working on Trinidad sugar estates, found widespread soil pollution, but especially concentrated in certain easily accessible places in the cane-field near the workers' barracks. It was greatly reduced after providing latrines and an educational campaign, while in about six weeks after the reduction of soil pollution and the treatment of the infected, the infestation of the soil with hookworm larvæ was practically eliminated, indicating that the life of the larvæ is short and that they do not migrate to any extent in soils, but may be carried by surface water from infected areas. Laboratory experiments also showed their life in soil to be limited to six weeks, thus allowing of successful measures being taken against infection through polluted soil. J. B. McVail[4] found that hookworm larvæ will pass through septic tanks in Bengal even when worked efficiently, and still more so when overworked, whilst chlorination sufficient to destroy coli bacilli had no effect on hookworm eggs or larvæ. N. Crichlow[5] has found 85 per cent of the people of the Solomon Islands infected with hookworms to a moderate degree, the average count of the hospital patients after **Oil of Chenopodium** being 40 ankylostoma. It had produced only a slight fall in their hæmoglobin, but treatment improved their physique. Bush villages showed higher infection than salt-marsh villages, as the latter used the foreshore as latrines.

Treatment.—P. Gupta and J. C. Guha[6] gave 60 gr. of **Thymol** divided into three equal doses, with thirty minutes' interval between them, without a purge before or after, with 62·47 per cent of cures after a single treatment, but consider a higher percentage essential to success.

M. C. Hall[7] has found **Carbon Tetrachloride** a safe, cheap, and effective drug for removing hookworm infection, having first demonstrated its action in dogs in doses of 0·3 c.c. per kilo ; it also removes ascarids and does not require a subsequent saline purge ; in monkeys, up to 6 c.c. per kilo was well borne. C. N. Leach[8] found 10-c.c. doses of carbon tetrachloride produced no ill-effect, while 12-c.c doses removed all hookworms and round worms, the cases including a convict who was executed shortly after the treatment and examined post mortem. L. Nichols and G. G. Hampton[9] have also used the drug with success in school children ; 3 c.c. were given on an empty stomach at 6.30 a.m. without preliminary or subsequent purge, an average of 36 hookworms being removed, 90 per cent being cured. It is cheap, keeps well, has no objectionable taste, is not depressing, and requires no purge, while chenopodium is soluble in it.

K. S. Mhaskar[10] deals with the mass treatment of hookworm in the light of his researches on the value of various anthelmintic drugs, and concludes that the simplest and safest effective methods are 50 gr. of either **Thymol** or **Beta-naphthol,** together with 25 gr. of **Light Magnesium Carbonate** as an alkaline drug to remove the mucus surrounding the worm. They may be given without purgatives before or after. Beta-naphthol is less than half the price of thymol and equally effective, and either can be used without admission to hospital. The same author[11] states that in some cases in which hookworm ova were still found after repeated anthelmintic treatment, delayed cure took place without further drugs.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1921, ii, 2035 ; [2]*Arch. of Internal Med.* 1921, 550 ; [3]*Jour. Amer. Med. Assoc.* 1922, i, 1227 ; [4]*Ind. Jour. Med. Research,* 1922, April, 806 ; [5]*Jour. Trop. Med. and Hygiene,* 1922, 123 ; [6]*Ind. Med. Gaz.* 1921, 108 ; [7]*Jour. Amer. Med. Assoc.* 1921, ii, 1641 ; [8]*Ibid.* 1922, i, 1789 ; [9]*Brit. Med. Jour.* 1922, ii, 8 ; [10]*Ind. Med. Gaz.* 1922, 208 ; [11]*Ind. Jour. Med. Research,* 1922, 799.

## ANTHRAX AND ITS PREVENTION. *Joseph Priestley, B.A., M.D., D.P.H.*

Anthrax-infected shaving brushes have come in for serious official attention during the last few years (*see* MEDICAL ANNUAL, 1921, pp. 257–8) ; the Government was compelled to act, and Prohibition Orders against the importation of shaving brushes from Japan were the result. Things have progressed since then. An International Commission has been appointed and has met, and, further, has reported to the effect that the governing body of the International Labour Office should include on the agenda of the next conference a draft convention established on the following bases :—

1. That hair used in the brush-making and upholstering industries be disinfected before the materials are handled industrially.

2. That wool and hair, to be used in the textile industry, be disinfected before the materials are handled industrially, except in the following cases : (*a*) If the country of origin is included in the schedule of countries where the danger is slight ; (*b*) If the material imported is disinfected before being put on board ship by a process recognized as effective ; (*c*) In such other cases as may be determined by the authorities specified.

N.B.—The above-mentioned schedule shall be kept up to date each year by the Advisory Committee on Hygiene constituted by the International Labour Office. Similarly, industrial processes of disinfection shall be approved by the Governing Body of the International Labour Office on the advice of the appropriate Committee, or, if necessary, on the recommendation of the Health Committee of the League of Nations.

Other brushes than shaving brushes are affected, the statistics for Great Britain being 183 cases (other than shaving brushes) and 38 deaths.

The International Advisory Committee on Anthrax has gone a stage farther, and suggests the exemption (in so far as disinfection of wool, hides, and animals is concerned) of those countries in which the raw material has not caused any cases of anthrax in the importing country for five years, unless anthrax spores had been discovered in the raw material by bacteriological examination; and in those countries of origin in which there was an absence of anthrax in an endemic state amongst animals or an application of strict measures for stamping out any outbreak at the source.

These provisional exemptions from restrictions are more than justified, as care must be taken not to restrict or hamper unduly a trade or business which is far-reaching and which connects Great Britain with many far-off countries. On the other hand, the workpeople must be efficiently protected, as anthrax is a disease which kills, and may be so readily introduced through infected skins into this country. A 'fallen' sheep, dead from anthrax in Persia, may cause the disease in workpeople in Bradford in Yorkshire!

## AORTITIS.

*Drs. C. Lian and R. Barrieu.*

(*Translated by Carey F. Coombs, M.D., F.R.C.P.*)

Diagnosis.—The chief signs of aortitis are:—

1. Pain or sense of constriction behind the sternum experienced on walking.
2. On auscultation a loudly accentuated second sound is heard at the base, with a systolic murmur conducted into the arteries of the neck.
3. With radiographic examination the aortic shadow is enlarged even with a slight degree of dilatation, though percussion is only able to discover the more considerable degrees of enlargement.

In addition to these last signs found on direct examination of the aorta, certain interesting facts may be discovered by examination of the peripheral arteries. The writer [C. L.][1] has shown that in aortitis, even in the absence of aortic regurgitation, the auscultatory method may show an abnormally wide divergence between the systolic and diastolic pressures. This exaggeration of the differential pressure is caused by a rise, absolute or relative, of the systolic pressure. Such a change is not pathognomonic, particularly in patients with slightly raised pressures. It is often found in tachycardias of thyroid origin, or those arising from hypersympathicotonia; nevertheless the observation of its existence is often of value in the diagnosis of aortitis.

More recently Mougeot[2] has applied the oscillatory method to the discovery of this sign, and has also emphasized its value. At the same time he describes three other arterial signs in aortitis: (1) The wide amplitude, the suddenness and rapidity of the displacements of the oscillometric needle. (2) The relative increase of the arterial systolic pressure in the lower limbs (this sign, described by Teissier as "signe de la pédieuse" in the abdominal aorta, and more recently by Hill and Flack in aortic insufficiency, may be lacking (Dumas),[3] as also those already described, in left ventricular failure). (3) The femoral pulse beats before that of the radial artery, although in the normal state they are synchronous (to discover this sign, graphic methods are necessary).

References.—[1]*L'Hôpital*, 1921, Jan., 714; [2]*Presse méd.* 1922, April 12; [3]*La Médecine*, 1922, March, and *Jour. de Méd. de Lyon*, 1922, Sept. 22.

## APPENDIX, SURGERY OF.

*E. Wyllys Andrews, M.D., F.A.C.S.*

### Acute Appendicitis.—

Etiology.—Seifert[1] has studied the incidence of appendicitis in relation to the climatic conditions. The results of his investigations, which were conducted in one clinic, were practically negative. Dieterich[2] made a similar study of the effects of geographical environment as a factor. This was also conducted over a small field, and no appreciable results were attained. At the same time both authors felt that there were such factors, and that further work might demonstrate them. The well-known fact that vegetarian peoples are singularly free from appendicitis and other intestinal diseases would naturally make one feel that intensive studies in small fields would yield similar results. Also the certain relationship between sore throats and appendicitis, and the well-established epidemics of the latter as well as the former, cannot be overlooked. Probably the type of organism responsible for the epidemic of throat infection is a large factor. For instance, it was quite noticeable that the recent influenza epidemics did not bring about the number of appendicitis cases which one would have been led to expect from studies of other such epidemics.

Behan[3] has made some interesting experiments on rabbits. The appendix was ligated and the results were observed. Simple obstruction of the lumen could not cause acute inflammation or gangrene ; numerous experiments of this sort were negative. Ligature of the vessels also failed to produce reaction. His conclusions are in part : " If the disturbance of the blood-supply in the meso-appendix does cause gangrene of the appendix, the only supposition for the origin of the gangrene is that the gangrene is due to a rapidly extending inflammatory process in the appendicular lumen, involving the muscular, mucous, and submucous coats and quickly spreading into the veins, thus producing thrombosis and gangrene of the ascending type, moist in character. Obstruction of the appendix may result clinically when a foreign body is present in the appendix and obstructs the lumen at some point where there has been a constriction. Gradual swelling of the mucosa may be sufficient to produce a strangulation of the submucous and muscularis layers, the same as occurs when a ligature or clamp is applied. When this stage is reached, gangrene supervenes."

Operation.—Ballance[1] has devised a new method of approach to the appendix. Starting as in an ordinary gridiron incision, the skin and external oblique are divided in the direction of the fibres of the latter. Then, instead of splitting the internal oblique and transversalis, they are cut through in the same direction as the incision in the superficial parts. The advantages are that much better exposure is obtained. Retraction of the edges of the incision requires much less force, and the pelvic brim is directly under the eye. Extension of the incision in either direction is very easy. In the discussion of Ballance's paper the procedure suggested was unanimously condemned. The main objection seemed to be that in the presence of infection, union of the cut ends of the muscles would be precarious. [However, the reviewer, while never having done this as a routine, has found it of decided advantage in certain cases. This class comprises those cases in which, in the presence of severe sepsis, the enlargement of an ordinary McBurney incision becomes necessary owing to technical difficulties encountered. If this enlargement is attained by extension of all the several incisions in the different layers, considerable fresh tissue is exposed to infection. If instead of this the inner layers are simply cut across their fibres, much more room is gained, and no further separation of the layers of the abdominal wall is necessary.—E. W. A.].

Brauenig[5] reports the ligature of the ileocolic vein in seven cases of ascending thrombosis and general septicæmia having their origin in the appendix. Theoretically, reasoning from the analogy of acute infections in other parts of the body, this ought to be a life-saving measure in certain desperate cases. He believes that in his experience it saved several apparently hopeless cases. The chills and fever stopped at once. The wound made in the mesentery must be carefully closed and buried, as one patient died of peritonitis originating in this wound. The vein is easily found if thrombosed, and can even be followed up to its origin. In very few cases of appendicitis is such a radical procedure warranted, and the cases must be carefully chosen; but where the indications are present, the operation is a valuable one.

**Chronic Appendicitis.**—Year by year it is becoming increasingly evident that we are doing too many appendectomies on this basis. Case after case comes to one with a history of appendectomy which has failed to give any relief. Lichty[6] has followed 400 patients who were operated upon for chronic appendicitis, and found that but 225 were cured; that is, 175 were subjected to a serious operation on mistaken diagnosis. These figures are not exceptional. Others have repeatedly called attention to the same results in other clinics. Many of these patients are of course neurotics, and no operations were indicated. Others subsequently were proved to have other pathology—gall-bladder, ureteral, renal, or pelvic in women. D'Acierno[7] presents an elaborate discussion of the pain element in appendicitis, and emphasizes the fact that in true chronic appendicitis the pain is usually referred to the umbilical region, and that pain over McBurney's point alone and with no other symptoms, is usually *not* due to disease of the appendix. [This fact cannot be too strongly emphasized. It has been proved again and again by careful follow-up studies, and I believe that misapprehension on this point is the cause of most of our bad results.—E. W. A.]. De Quervain[8] also emphasizes the importance of the reflex phenomena due to the appendix. [In my own experience these are of the greatest importance, and overshadow all other features of the disease. —E. W. A.]. Whiteford[9] goes still farther, and even denies the existence of such a disease as chronic appendicitis. He says that the results have been so bad that it is producing doubts in the mind of the laity about the necessity of surgery even in acute cases, and distrust in the efficacy of surgery.

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## ARTERIAL TENSION, HIGH.

*Drs. C. Lian and R. Barrieu.*
(*Translated by Carey F. Coombs, M.D., F.R.C.P.*)

Measurement.—Just as the taking of the arterial pressure by the oscillatory method has led to a study of the clinical value of the oscillatory curve (oscillometry), so also the auscultatory method opens up a new line of cardiovascular research by leading to the study of the clinical value of the curve of arterial sounds. This study, named by the writer [C. L.] 'phonometry',[1] had till recently only been outlined. But it has just been treated in a notable manner by Barbier[2] in his inaugural thesis.

*The Normal Auscultatory Curve.*—It is known that in the course of the measurement of arterial pressure by the auscultatory method there are heard, during deflation of the armlet, first of all small arterial sounds; then blowing murmurs; after that progressively increasing sounds like the crack of a whip; last of all, dull, vague, and inconstant sounds. In the curve thus formed, Barbier distinguishes two chief zones: the first, which is in the neighbourhood of the level of the maximum pressure, in which the arterial sounds are mainly due to the movements of the blood; the other in the neighbourhood of the minimum level, where the arterial sounds depend mainly on the tone of the arterial walls.

*Variations in the Intensity of the Arterial Sounds.*—The arterial sounds are accentuated in two sets of conditions: when the wave of blood is thrown out by an abnormally sudden cardiac systole—e.g., in compensated hypertension, or when the arterial tone is increased as in hypersympathicotonia. On the other hand, the arterial sounds are diminished in myocarditis, in low tension, and in cases of decreased arterial tone due to hyposympathicotonia. The blowing sounds tend to disappear when the arterial pulse is bounding, as in aortic insufficiency, and on the other hand to be increased when the up-stroke of the pulse is accomplished with difficulty or in two stages, as in the anacrotic pulse of aortic obstruction.

*The Auscultatory Gap.*—Let us suppose that the arterial sounds reappear when the armlet has been released down to a pressure of 170 mm.; at 160 the sounds are still quite clear, at 150 and 140 they are no longer to be heard, at 130 they reappear, and thereafter increase at 120, 110, and so on. Thus during the process of decompression there is produced at 150 and 140 mm. the phenomenon of the 'auscultatory gap' described by Tixier of Nevers, and the frequency of which has been demonstrated by the writer [C. L.]. According to Barbier, this gap is the outcome of difficult ventricular discharges where the heart has to make its systolic effort in two stages (anacrotic pulse), or slowly, so that it is principally met with in aortic obstruction or high arterial tension.

*Conclusion.*—It is seen from this short résumé of a few of the ideas set forth by Barbier, that the study of the arterial sounds heard below the armlet should not be rigidly limited to measurement of the systolic and diastolic pressures, easy and accurate though this is. It is also of value in helping us to appreciate functional cardiac disturbances, and moreover it brings to light valuable evidence as to the equilibrium of the sympathetic nervous system.

Prognosis.—It is very difficult to form an accurate forecast in hypertension. The difficulties are, however, materially lessened by several recent contributions, which, approaching the problem from different standpoints, are complementary to each other.

Vaquez and Leconte[3] consider the prognosis under different clinical pictures: "If the pressure rises rapidly or is subject to sudden elevations, the outlook is not so good as it is when the pressure has risen insensibly and stays steadily at a fixed maximum." Hypertension is particularly grave in young subjects, but often well enough borne by elderly persons. Troublesome signs are albuminuria, especially if abundant and persistent or increasing; and the presence of tube casts. The value of nitrogen retention as a prognostic sign is well known since the work of Widal. The high tension of syphilitics is well borne, and the same is true of that seen at the menopause. When the test of provoked diuresis is bad (Vaquez and Cottet) the prospects are gloomy. Graham Stewart[4] agrees with Vaquez that sudden sharp rises of pressure are dangerous to persons with high tension, while the moderate hypertension of the menopause, on the other hand (reaching 160 to 185 mm. systolic pressure), is generally without risk. He does not feel disposed to a gloomy prognosis except where chronic nephritis or arteriosclerosis co-exists. He wisely advises waiting upon the results of treatment to form a prognosis, and extols the effects of a daily dose of the **Sulphates of Magnesium** and **Sodium.**

The writer [C. L.] with his pupils, R. Broca and J. Clement,[5] has shown that if the diastolic pressure in the brachial artery, taken with the patient lying down, is maintained at a level of 140 mm. Hg or higher, a bad prognosis is justified. Of 24 such patients seen in hospital between 1911 and 1914, only one was still alive in 1921, and his pressure has yielded somewhat to treatment. There is, therefore, not much hope of survival beyond five or six years, at all events in working-class surroundings. Observations made since the war on persons in easier circumstances encourage a belief that under such conditions a larger percentage of survivals may be looked for; yet a continuously high diastolic pressure must always awaken serious misgivings.

Finally, de Meyer[6] insists on the importance of the amplitude of the pulse-pressure in prognosis: "Every hyperpietic seen by us with appreciable microsphygmy—i.e., with reduced pulse amplitude and small oscillometric index—has gone the way of fatal cardiorenal disease ; in spite of drugs, diet, etc., to reduce tension, death has followed without any appreciable relief, all the pulse-tracings have shown a small wave, and no treatment has ever accomplished any effective action on this over-distention or sclerosis of arteries ".

TREATMENT.—A new depressor, **Garlic**, has been brought to light by Loeper, Debray, and Pouillard,[7] in the form of fresh cloves of garlic, well peeled and macerated in spirit. They prescribe 20 to 30 drops per day, in a single dose, for three or four days, followed by five days' interval. Unless these conditions are strictly observed, they say that no fall in pressure will take place ; on the other hand, the pressure may rise if a total dose exceeding 100 drops be given within several days. Garlic has also a cardiotonic effect. It is to be feared that this new depressor has, like its predecessors, only a transient effect. As the reviewers have said :[8] " The drugs classically held to be depressors have only a temporary action, which should be reserved absolutely for use in certain paroxysmal syndromes due to high tension. Nitrogen-free dieting, purgation, blood-letting, theobromine, and digitalis (the latter in the cardiac failure of high tension) are the true depressors ". The writer is accustomed to prescribe a diet in which both nitrogen and chlorides are restricted, while reserving absolute dechloridization for cases in which high arterial tension is accompanied by cardiac failure. Vaquez has well expressed the dangers of the ingestion of salt, and more recently Bezançon, with de Jong and Jacquelin,[9] has insisted on the beneficial effect of a **Chloride-free Diet** in cardiac asthma.

Many recent American writers (Allen and Morristown,[10] John H. Musser,[11] M. J. Konikow and Millard Smith,[12] and Harris A. Houghton[13]) demonstrate the prime importance of dietetic prescriptions in hypertension. Moreover, they show that even in the absence of cardiac failure, chloride-free diet gives remarkable results, thus justifying the opinion of Ambard and Beaujard, who proved the frequency of chloride retention in persons with high blood-pressure, concluding from this that it was a factor in the causation of that pressure.

Houghton's practice and results in ten cases may be referred to here. He orders a **Salt-free Diet** of such a kind that the food does not contain more than 2 grm. of sodium chloride per day. No salt whatever is used in the preparation of the food ; sugar and purin bodies are restricted or not according to the results of chemical examination of the blood. The intake of water is reduced to 400 or 500 c.c. The author thinks that the cause of the malady having injured the kidneys, the first function to suffer is that of sodium chloride excretion, whence follow retention of salt in the blood, retention of water to maintain the osmotic pressure, distention of the arterial tree, and thus hypertension. However that may be, in the ten cases which he reports, under the influence of these prescriptions alone, the hypertension disappeared in five, seven, or ten days. In several cases, indeed, the tension fell from well above to slightly below normal, for instance from 200 or 160 mm. to 105 mm. In such cases the addition of 2 grm. of salt effects an immediate return to the normal pressure.

These results, which have been lasting in those cases that have been under observation long enough, are accompanied by various subjective discomforts. These ought to be prevented, so that there may be no refusal to follow the prescribed diet. On the third day a sensation of lassitude is felt, which is overcome with great difficulty. But several times, when, in order to encourage a patient to persevere, he has been permitted the use of a little salt with his food, it has been found that the taste for it has gone, and is replaced by a distinct dislike. Even children have refused its use. Lest high tension be too rapidly reduced in patients whose systolic pressure is above 200 mm., he orders a diet which at first contains 4 grm. of salt; then several days later this is changed so as to contain less than 2 grm. daily. If the hypertension does not fall much in a week, it is either because the diet is wrongly prescribed, or imperfectly followed, or because the renal lesions are very severe. In this latter case, prolonged use of a salt-free diet may be expected eventually to get rid of the high tension.

Under the influence of Houghton's prescriptions, patients may lose as much as fifteen pounds in weight during the first week. There is reason to think that this loss of weight is partially responsible for the fall of the blood-pressure ; in fact, in stout persons with high tension who submit to reducing diet, it is usual to see the weight and the blood-pressure undergo a parallel decline. R. H. Rose[14] has just published several observations proving this fact. Under the influence of a reducing diet, he is accustomed to see high tension fall. A pressure of 200 mm. systolic, 120 diastolic, usually falls within the first week to 180 mm. systolic and 100 diastolic, and at the same time shortness of breath, palpitation, headache, and œdema diminish or disappear.

References.—[1] " Appareil Circulatoire ", *Technique Clinique Médicale*, Sergent 5th ed., Paris, 1922 (Maloine) ; [2]*Thèse de Lyon*, 1921 (Baillière) 278 ; [3]*Paris méd.* 1921, July 2 ; [4]*Practitioner*, 1921, ii, 183 ; [5]*Presse méd.* 1921, 743, and *Thèse de Paris*, Clement, 1921 (Jouve) ; [6]*Report of XVth Congr. Franç. de Méd.* 1921, Strasbourg ; [7]*Presse méd.* 1922, 473 ; [8]*L'Année méd. prat.* 1922, 221 (Maloine) ; [9]*Presse méd.* 1921, 373 ; [10]*Jour. Amer. Med. Assoc.* 1920, ii, 652 ; [11]*N. Y. Med. Jour.* 1921, ii, 570 ; [12]*Boston Med. and Surg. Jour.* 1921, ii, 281 ; [13]*Med. Record*, 1922, i, 441 ; [14]*N. Y. Med. Jour.* 1922, i, 752.

## ARTERITIS, CHRONIC OBLITERATIVE.

*Drs. C. Lian and R. Barrieu.*
*(Translated by Carey F. Coombs, M.D., F.R.C.P.)*

Treatment.—**Citrate of Soda,** already used in so many ways because of its anticoagulant action, finds a new sphere of usefulness in the treatment of obliterative arteritis. In the United States, Willy Meyer[1] and Steel[2] have given it intravenously for thrombo-angiitis obliterans. In France, Ozo,[3] also Morichau-Beauchant,[4] have given it in three cases of obliterative arteritis, and attribute the favourable course of events to its use. As, however, nothing is more variable than the course of this disease, it is too early as yet to express a definite opinion on this form of treatment. In three cases of intermittent claudication we have given the drug by mouth, 10 grm. daily, without much result ; the patients have not been relieved of pain on walking. On the other hand, it is curious and somewhat disconcerting to find that Neuhof and Hirshfeld (reported by Cheinisse)[5] give intramuscular injections of citrate of soda—which are very painful—to check hæmorrhage. This paradox can only be explained by Hedon's view, that the action of this drug varies with the dose employed.

The practical conclusion is that citrate of soda is a drug worthy of further study, but not dangerous. It may be tried in the treatment of obliterative arteritis (intermittent limp, or gangrene) and of thrombo-angiitis obliterans. We recommend full doses, for instance, 10 grm. per day, divided into five doses, for a fortnight, to be continued for a variable period in moderate doses (4 to 6 grm. daily).

In cases where oral administration fails, intravenous injection after Steel's plan may be used. In the first month, 250 c.c. of a 2 per cent solution of citrate of soda should be injected intravenously every other day. This treatment should then be continued for six to ten months, increasing the intervals between the injections up to a fortnight. Steel's patients thus received 30 to 50 intravenous doses.

References.—[1]*Ann. of Surg.* 1916, March ; [2]*Jour. Amer. Med. Assoc.* 1921, Feb. 12 ; [3]*Gaz. des Hôp.* 1920, Sept. 21 ; [4]*Soc. Méd. Hôp. de Paris*, 1922, March 3 ; [5]*Presse méd.* 1922, Oct. 14.

## ARTHRITIS.

*Charles E. Sundell, M.D., M.R.C.P.*

Timbrell Fisher,[1] in his Hunterian Lecture, has detailed his clinical and experimental observations upon chronic arthritis. He divides the cartilage of articular surfaces into two areas, central and peripheral: while the former is bare, the latter has an epithelial covering derived from the perichondrium and the relic of the complete epithelial covering of the joint-surface in the early fœtus (*Plate X, A*). The central cartilage is nourished by lymph exuded from large convoluted vessels lying beneath it in the cancellous bone spaces; the peripheral surface layer is nourished from the circulus arteriosus articuli. Though no channels can be seen in cartilage, it is threaded by a network of mucinous tracts which probably serve to convey nutriment (*Plate XI*). Analyses of synovial fluid show that its protein-content is only one-third or one-half that of lymph plasma, and he is of opinion that, except for the most superficial cells of the central articular cartilage, the synovial fluid can play no part in nutrition.

The degenerative changes in arthritis commence by a 'fibrillation' of the cartilage—a splitting of the matrix without fibrous metaplasia; later, cystic degeneration may occur (*Plate X, B*). The surface of the articular cartilage may be rendered irregular by smooth rounded elevations due to the invasion of the deeper layers of the cartilage by vascular inroads of osteoblasts actively forming new bone, the cartilage cells simultaneously proliferating to form epi-articular ecchondroses. As the changes progress, the cartilage gradually disappears from the central articular area, revealing the subjacent bone. Lipping of articular margins succeeds degeneration of central areas; this new cartilage produced by proliferation due to activity of the perichondrium may be invaded later by osteoblasts, and the cartilage may be reduced to a thin shell, or disappear. In osteo-arthritis this peripheral proliferation is compensatory, and tends to enlarge the articulating surfaces rather than to interfere with movement. In rheumatoid arthritis the early changes are capsular; by limiting movement they allow a pannus from the synovial membrane to spread over articular surfaces, and may lead to disappearance of the latter.

Arthritic changes in the bone consist in the formation of sclerotic areas under the cartilage, and in these cystic degeneration may occur. Arthritic changes in synovial membrane consist in early turgescence and enlargement of the villi, often associated with deposition of fat. In the later stages arterio-sclerotic changes may occur; but in view of their late development these cannot be regarded as causal factors in the joint lesion.

The writer found that in 95 per cent of his cases of osteo-arthritis toxic foci were present: in all these cases treatment of the toxic focus did good. He holds that the resistance of joints to toxic influences is only gradually broken down, and thus explains the frequency of the onset of joint changes after middle life. He holds that trauma plays a part, but has failed in animal experiment to produce arthritic changes of a chronic nature by single or repeated injury in the absence of sepsis.

Treatment is discussed briefly. Greatest importance is attached to the eradication of foci of toxic absorption and the diminution of articular pressure. Surgical removal of osteophytes is indicated when they interfere with movement, when they cause pain by pressure upon a nerve, and when they themselves are subject to painful pressure. Attention is called to the fact that excision of the hip and turning out of the femoral head are associated with considerable shock in old people.

Mutch[2] draws attention to the part played by *derangement of the small and large bowel* in the production of chronic arthritis. His observations are based upon a series of 200 cases of multiple arthritis in which gout, venereal disease,

# *PLATE X.*

## CHRONIC ARTHRITIS

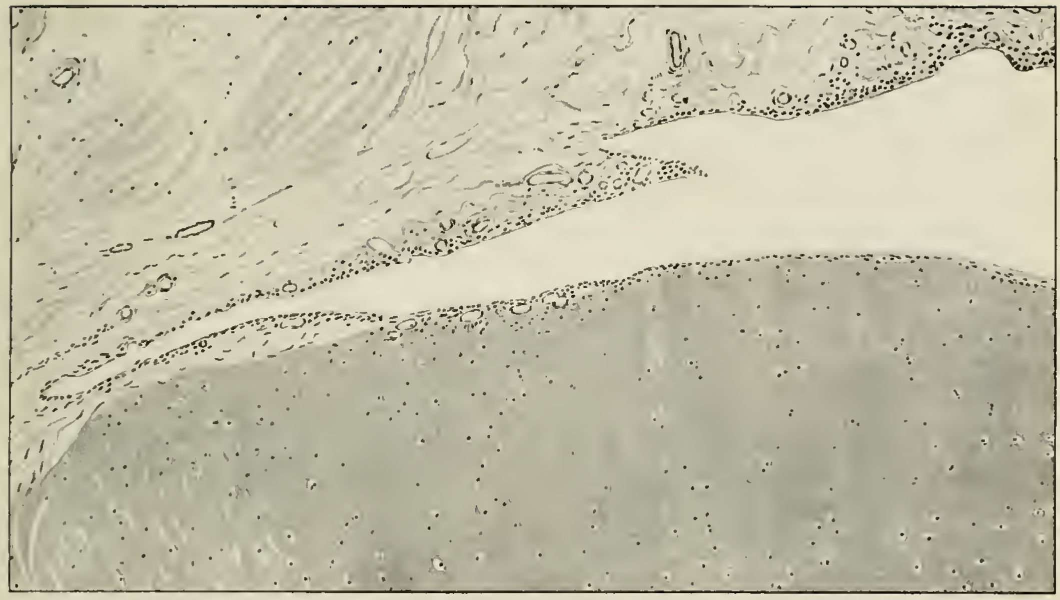

*Fig. A.*—Vertical section of normal articular cartilage from lower part of human patella, showing synovial membrane above, which extends for a certain distance at the margin over the articular cartilage. (Two inch obj.)

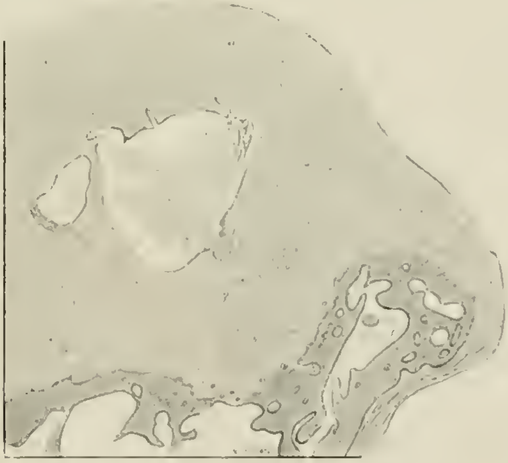

*Fig. B.*—Cystic degeneration of articular cartilage near base of osteophyte.

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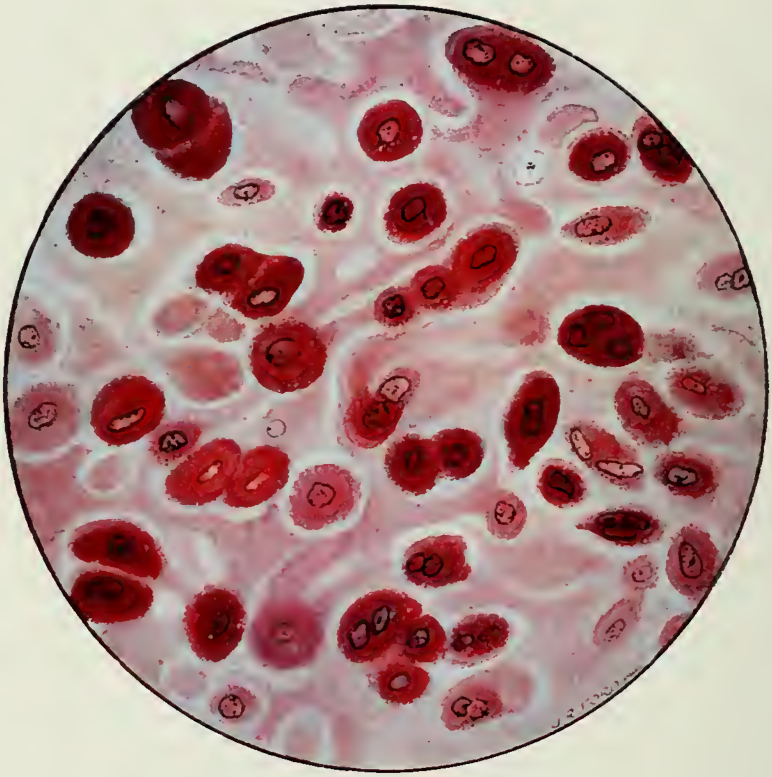
## CHRONIC ARTHRITIS—*continued*



Cartilage stained by carbol-thionin which reveals the lines of softer matrix along which possibly the inhibition of nutrient fluid takes place. (Two-thirds obj.)

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and tuberculosis could be excluded. While acknowledging the frequency of an oral or tonsillar source of toxic absorption, he points out that in 15 per cent of his cases joint-changes commenced two to twenty years after complete dental extractions had been carried out, and that two cases were quickly cured by colectomy, although in one septic tonsils, and in the other pyorrhœa, were left untreated. He holds that alimentary infection may arise from a single focus, or more often from a wide tract. Bacteriological examinations of intestinal contents at different levels have been carried out during laparotomies, and have shown that while the *Bacillus coli* predominates in the large gut, non-hæmolytic streptococci of various strains are the most numerous organisms in the small intestine; their predominance increases towards the upper end of the gut. Investigation of the bowel derangements present in his cases showed that stagnation was as common in the small gut as in the colon; it was present in 90 per cent. Ptosis was common; in 25 per cent the greater curvature of the stomach was within an inch of the symphysis pubis, and in 66 per cent the cæcum was deep in the pelvis. Colonic flatulence was present in 65 per cent, and diarrhœa in 33 per cent. Unsuspected stasis and hidden bowel-sepsis are very common. For detection of the streptococci of the small intestine he advocates giving the patient an ounce of lactose, a drachm of magnesium sulphate, and the juice of a lemon, in water, before breakfast on three consecutive mornings, and examining the stools which are passed on the third day.

A certain degree of thyroid inadequacy was present in many of his cases. Appropriate **Vaccine Therapy** combined with **Thyroid Extract** produced very great improvement in 89 per cent of his series.

Herbert[3] calls attention to the *jaw-neck syndrome* as an invaluable aid in the differential diagnosis of toxic or infective arthritis, and gout or rheumatism. He "would put it as a definite law that in gout and true rheumatism the syndrome is always absent, and conversely that in the toxic and infective group it is practically always present". The signs in the jaw are not so constant as those in the neck; in the latter they consist of pain below the occiput, stiffness and sometimes creaking in the occipito-atlantoid or upper cervical joints, or thickening and pain in the periosteal or fibrous tissues connected with the cervical spinous processes.

Ely[4] pleads for a simpler classification of arthritis. He claims that all cases fall into one of two easily separated groups: (1) Infective in origin, associated with proliferative inflammation of synovial membrane or bone-marrow and thinning of cartilage, with some rarefaction but no new formation of bone; (2) Of unknown origin, 'senile', associated with necrosis in bone-marrow and with new bone-formation, e.g., Heberden's nodes. The cases in the first group result in cure or fibrous ankylosis; those in the second group are never cured but never proceed to ankylosis. As a possible causal factor in the second group he suggests infection with *Amœba histolytica*. He regards the primary change in this group as a bone-marrow necrosis, and looks upon the frequent cystic degeneration of the bone as a consequence of this; new bone formation occurring round the cystic area leads to lipping and eburnation.

Billings, Coleman, and Hibbs[5] give the end-results of 411 cases of chronic arthritis treated between 1905 and 1915. Their basal conception is that chronic arthritis is due to septic foci communicating with a mucous surface or the skin, or to secondary foci in lymph-glands, and they hold that either primary or secondary foci may be the source of bacteriæmia. They consider, as a result of their examinations of primary foci and infected joints and muscles of their patients, and from intravenous injection experiments upon animals, that chronic arthritis is usually caused by non-hæmolytic strains of streptococci of low virulence. They find that small blood-vessels may be blocked by clumps of bacteria or by endothelial proliferation caused by the infection, and that a serofibrinous exudate still further interferes with the blood-supply of the affected parts. The bacteria lodge in the peri-articular vessels and in the smaller branches of the nutrient artery which end in the epiphysis. They attribute chronicity after removal of the primary seat of sepsis to secondary foci beyond surgical reach, or in the muscles and joints themselves. They quote cases in which relapses occurred after necessary and complete oral cleansing, and were found to be associated with cholecystitis or appendicitis.

Munro[6] has investigated the blood of 100 cases of rheumatoid arthritis. He finds that all the patients are anæmic, but that the deficiency may be in the hæmoglobin only. The average colour index is 0·67. A leucocytosis was present in 61 per cent ; in 14 per cent the white cell count varied between 14,000 and 30,000 per c.mm. In 24 per cent he found a leucopenia, and he suggests that in these patients the reaction to infection was failing. In 35 per cent there was a preponderance of polymorphonuclears, and in 57 per cent an excess of lymphocytes ; in this connection the suggestion is made that syphilis and tubercle may have an adjuvant effect upon certain cases of the disease. He also reports upon the examination of 50 joint effusions: in 4, cultures were obtained of Gram-positive cocci; cell counts showed a preponderance of polymorphs, and total numbers of white cells which would correspond to a leucocytosis in blood.

Bierring[7] describes fully a case of *intermittent hydrarthrosis*, and reviews the literature of the seventy-six published cases. His patient was a man, age 36, who had suffered from the condition for twelve years; for five years the periodicity had been carefully recorded ; confined for a long time to one knee, the condition later involved both. Intervals between swelling were remarkably constant : the knee was normal in appearance for twelve days ; then swelling commenced, and ran its course in six days ; there was never any redness or heat of the joint. Most elaborate search failed to reveal any cause for the condition, except that early in the course of the malady the patient had suffered from two attacks of generalized arthritis. A study of published cases shows that the periodicity is most often twelve days ; it varies between two and thirty. There is never any endocarditis. The relation to malaria which has been suggested is very unlikely. There is a tendency to remission, and the ultimate outlook is favourable. The etiology of the condition is quite obscure, but an angioneurosis is a possible explanation, and the supporters of this view call attention to the very abundant nerve-supply of the vessels of the knee-joint.

Treatment.—Billings, Coleman, and Hibbs[5] attach great importance to the restoration of circulation in the affected areas, and advocate alternate **Hot and Cold Showers** or **Sprays** ; forcible rupture of adhesions is discountenanced. The use of **Autogenous Vaccines** in doses of 300 to 500 million appeared beneficial, and was not associated with unpleasant local or general reaction. Polyvalent streptococcal horse serum produced a moderate reaction, but was discontinued on account of the occurrence of several instances of anaphylaxis. Intravenous **Injections of Protein** produced a marked reaction and some improvement, but they are unable with the small amount of material at their command to give an opinion upon its value. They hold that specific bacterial antigens are of little or no value in the treatment of chronic infectious arthritis.

Snyder and Ramirez[8] publish the results of four years' observation of 70 cases of chronic arthritis treated with intravenous injections of foreign protein. They claim to have had 6 complete cures without relapse over a period of fifteen months in patients who had previously been helpless invalids. In these patients the disease had been present for less than two years, but previous treatment upon the usual lines had been ineffectual. They find that in cases of longer standing the results are not so good. They employ doses of 10 million dead typhoid bacilli or of ½ to 1 gr. of secondary proteose prepared from milk; the injections are given once a week and preceded by active purgation. The dose must be adequate to produce a chill; so long as this occurs no increase of dose is indicated. While they find that typhoid vaccine and secondary proteose have equal therapeutic value, they consider that typhoid vaccine is the more dangerous on account of its uncertain dosage, the presence of endotoxins, the risk of contamination with live organisms, and the presence of primary proteoses. They assert that secondary proteose cannot produce anaphylactic shock. They regard the following conditions as contra-indications to this treatment: tuberculosis, extreme emaciation, cardiac decompensation, and excessive hypertension.

Cowie[9] advocates similar protein therapy. He uses doses of 100 to 500 million dead bacilli, and has had no bad results beyond reaction—headache, nausea, and vomiting. He emphasizes the importance of eradicating septic foci before the treatment is commenced, and he finds that it is most successful in acute cases. Waggoner[10] records satisfactory results of this treatment. He uses doses of 20 to 50 million bacilli, giving one to five injections at intervals of three to four days. Acute cases respond best; chronic cases are less satisfactory, but 80 per cent are improved.

Eidelsberg[11] recommends **Intramuscular Injections of Milk.** He records his experience with 50 cases of arthritis of moderate severity and a duration of six months to five years. No other treatment was employed during the course of injections. Some patients had previously had septic foci dealt with; others were still the subjects of sepsis, but this was left untreated. Of his 50 cases, 5 were cured, 27 improved, and 18 were uninfluenced. The injections are prepared by heating milk in a closed vessel standing in water at 100° C. for twenty minutes; exclusion of air prevents the formation of a surface film of casein. The doses are given deeply into the gluteal muscles at intervals of three to seven days. The first dose is 4 to 6 c.c.; subsequent doses are increased to 7 or 10 c.c.; only five doses are given, and if there is no improvement after the second or third dose the treatment is discontinued. In 50 per cent there is no unpleasant reaction; in the other 50 per cent chills, fever, headache, depression, and nausea come on within six or twenty-four hours, and may persist for five or six days.

Herzfeld[12] strongly advocates **Intravenous Salicylate Therapy.** He has employed a 17·5 per cent solution of sodium salicylate under the name of '**Attritin**' in the treatment of acute and subacute rheumatic affections of joints and muscles. He recommends an injection of 4 c.c. every day or every second day or, in severe cases, twice daily. He claims that relief can be given by a single or a few doses in acute cases, and that he has seen no bad results.

Geyser[13] recommends the intravenous injection of **Sodium Salicylate** and **Potassium Iodide** in 15-gr. doses of each every second day. In acute cases the injections may be given thrice daily, and six doses usually remove all discomfort. He uses intravenous injections of **Cacodylate of Iron** two or three times a week as a supplementary measure, and is a strong advocate of copious perspiration and the use of diathermy to increase local circulation.

Hanzlik and Scott[14] have investigated the value of **Cinchophen, Neocinchophen,** and **Novaspirin** in the treatment of rheumatic fever. They conclude that both cinchophen (atophan) and neocinchophen are promising therapeutic agents, but that novaspirin is worthless. Cinchophen is injurious to the kidney, and neocinchophen is variable in this respect; both produce symptoms of salicylism. Chace, Myers, and Killian[15] have carried out somewhat similar investigations upon 50 cases, and are impressed with the value of these drugs in acute infective arthritis. They find that they both stimulate renal elimination of other waste products besides uric acid, and have less tendency than similar doses of salicylates to produce albuminuria and the passage of casts, and they may be preferable to salicylates in cases of renal disease.

Meyer Bisch[16] recommends weekly intragluteal injections of a 1 per cent suspension of **Sulphur** in olive oil, commencing with a dose of 2 c.c. Dobson[17] has also found injections of sulphur in oil beneficial. Fantoni[18] gives intravenous injections of 4 mgrm. of **Perchloride of Mercury** in 4 c.c. of normal saline daily for four days in acute rheumatism.

**Ionization** is strongly supported by Davies,[19] who recommends the use of tincture of iodine and carbonate of lithia, with a current of 5 to 25 ma. for twenty minutes. Somerville[20] speaks highly of the value of ionization with 2 per cent quinine hydrochloride or 2 per cent sodium salicylate and 1 per cent potassium iodide, using a current of 15 to 75 ma.

*Surgical Treatment of Osteo-arthritis.* Platt[21] discusses the treatment of chronic arthritis of the hip. Manipulation under anæsthesia has a value in early cases unassociated with severe pain; the improvement may last for years. Excision of osteophytes is an operation of doubtful value and limited application. Arthrodesis is good in theory but difficult to secure in practice, and is only suitable for younger individuals. Excision of the head of the femur, leaving a rounded end to the neck of the femur and transplanting the great trochanter downwards along the femoral shaft, is an operation which has yielded satisfactory results in his hands. It necessitates rest in an abduction frame for six weeks, and then the use of a caliper splint for six months. The operation gives relief from intolerable pain. Todd[22] discusses at some length the orthopædic aspects of rheumatoid arthritis, and pleads for the adoption of more active surgical measures to prevent or reduce deformities. He advocates preliminary treatment of septic foci, but holds that 'clean cutting must replace tearing', and emphasizes the danger of manipulative measures in feeble patients.

TREATMENT.—[1]*Brit. Jour. Surg.* 1922, July, x, 52; [2]*Lancet*, 1921, ii, 1266; [3]*Ibid.* 1097; [4]*Med. Record*, 1922, Feb. 11, 223; [5]*Jour. Amer. Med. Assoc.* 1922, April 15, 1097; [6]*Lancet*, 1922, i. 938; [7]*Jour. Amer. Med. Assoc.* 1921, Sept. 3, 785; [8]*Arch. of Internal Med.* 1921, July, 50; [9]*Jour. Amer. Med. Assoc.* 1921, Dec. 17, 2000; [10]*Ibid.* Sept. 24, 1049; [11]*Ibid.* 1922, June 10, 1788; [12]*Münch. med. Woch.* 1922, May 19, 735; [13]*N. Y. Med. Jour.* 1921, Dec. 21, 707; [14]*Jour. Amer. Med. Assoc.* 1921, June 18, 1728; [15]*Ibid.* Oct. 15, 1230; [16]*Münch. med. Woch.* 1921, 516; [17]*Med. Press*, 1922, June, 559; [18]*Gaz. deg. Osped.* 1920, 380; [19]*Practitioner*, 1921, Dec., 432; [20]*Brit. Med. Jour.* 1921, ii, 825; [21]*Ibid.* 1922, i, 672; [22]*Lancet*, 1922, i, 515.

## ASTHMA, BRONCHIAL.

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

Longcope[1] showed from analysis of several hundred asthmatic patients that approximately 50 per cent gave definite skin reactions to some protein substance. The result is strictly in accordance with the figures obtained by numerous British and Continental observers. Longcope also emphasizes the fact that asthma is not exclusively the result of protein poisoning, since it has been repeatedly observed to follow the exhibition of alkaloids such as quinine, benzene derivatives such as salicylic acid or aspirin, or even metals such as mercury or arsenic.

In discussing whether some cases of asthma are due to nervous reflexes, or whether all are due to protein sensitization, Freeman[2] considers there is no single cause, but a chain of circumstances, of which at least three links are necessary in every case: protein sensitization, hereditary diathesis, and precipitating nervous reflexes.

Coke[3] emphasizes the importance of the skin reactions when thoroughly carried out. He considers that one class of asthma may depend on the presence of histamine, or that poison group which can be split off from every protein molecule, whether liberated parenterally by anaphylaxis or formed in the gut by bacterial action or faulty digestion. He presupposes a specific enzyme to split up and digest all foreign proteins. The manufacture of this enzyme takes time, hence an incubation period of ten to fourteen days, at the end of which period the protein is so rapidly digested that a quantity of the poison group is thrown off, and the symptoms of serum sickness ensue.

Gow[4] lays stress on the sensitivity of many asthmatics to **Witte's Peptone,** and the necessity for proceeding cautiously when treating asthma by intravenous injections of peptone. Latham[5] draws attention to the fact that peptone must be injected very slowly, death having been caused before now by rapid injection. He points out that, when a specific protein poison cannot be established, immunization against all foreign proteins may be attempted in one of three ways: (1) Intravenous injections of peptone: (2) The Danysz method of vaccinating with cultures of all the intestinal microbes that will grow on a sloped gelatin or peptone culture; (3) Massive intravenous injections of dead typhoid bacilli. All these methods at times give good results, but are often disappointing.

Rogers[6] claims excellent results by treating asthma with **Autogenous Streptococcal Vaccine:** 52·5 per cent of his cases remained well from half to four years after the treatment, 32·5 were afforded great relief, and only in 15 per cent was there failure. These cases were treated in India, and the results are very much more favourable than those commonly obtained from similar treatment in Great Britain.

Funk and Vaughn[7] consider that the younger the patient when the asthma begins, the more certain is the factor of protein sensitization; 90 per cent of cases starting in childhood show this factor. Cases starting after forty years of age show some other cause, such as cardiac or renal disease, or focal bacterial infection. These writers state that vaccine treatment is indicated in most cases of asthma, autogenous vaccines from the sputum, from an infected tooth, or from a nasal sinus being preferable to a stock vaccine. They find, however, that continuous vaccine therapy is necessary to keep these patients free from asthma; but it seems probable that the benefit obtained is analogous to that derived by other patients from the intravenous injections of dead typhoid bacilli rather than to any specificity of the antigen employed.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1921, Nov. 12: [2]*Brit. Med. Jour.* 1921, Aug. 13; [3]*Ibid.*; [4]*Ibid.*; [5]*Lancet,* 1922, i, 261; [6]*Brit. Med. Jour.* 1921, July 16; [7]*Therap. Gazette,* 1921, Oct.

## AVULSION OF SCALP. (*See* SCALP.)

## BANTI'S DISEASE. (*See* SPLEEN, SURGERY OF.)

## BASAL METABOLISM.

*O. C. Gruner, M.D*

The amount of heat produced by the body is a measure of the rate at which metabolism is taking place in the body as a whole. This amount, as is well known from everyday experience, is increased by physical exertion, the increase being greater the greater the muscular activity. Emotions, posture, partaking of food, physical discomfort, and innumerable other activities all change the amount of heat output, and yet there is a constant for each individual. This constant is called the 'basal metabolism', and is present, for instance, on waking from a night's sleep, before rising from bed. The idea in the word 'basal' is to express the minimal metabolic activity inseparable from the absolutely essential functions of life. As Benedict[1] says, the minimal heat production is an index of the state of the internal glandular and muscular activities incidental to the maintenance of life.

In concrete terms, the basal metabolism may be described as the number of calories produced per hour per square metre of body surface ; but in practice it is usual to express an alteration of basal metabolic rate as an increase or decrease per cent, instead of stating the actual number of calories. For an adult between twenty and forty years of age the actual number of calories is given by Lusk as about 40.[2] The accompanying chart (*Fig.* 10) is convenient for visualizing the chief features about normal basal metabolism (Fleming[3]). It shows the changes occurring at different ages. The lowest shaded area gives the basal metabolism, which is seen to be higher in infants than in adolescents. The successive areas above this represent the additions to metabolism involved in the different kinds of activity—growth, exercise, excretion. The heat output from exertion is greater during early adolescence than at other ages.

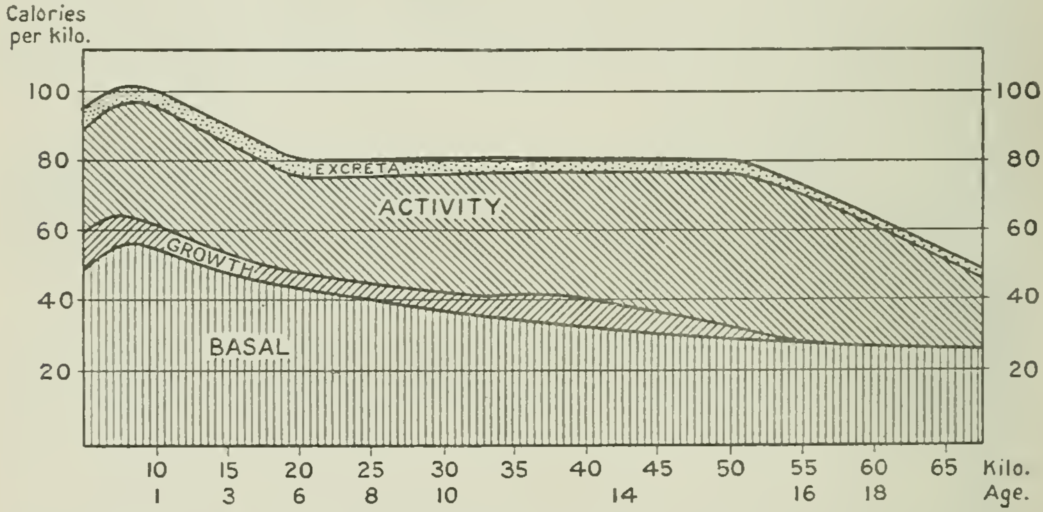

*Fig.* 10 (*after Fleming*).—The total daily caloric requirements per kilo. from infancy to adult life referred to age and weight.

The interest of the whole subject lies in the relation which has been found to exist between basal metabolism and thyroid function. Plummer and Boothby[4] have shown that the production of heat by the body entails the presence in it of from 12 to 14 mgrm. of thyroxin, and they estimate the daily loss (which therefore has to be made up) at 0·5 mgrm. There is a close association between disturbances of metabolic rate and the various clinical conditions in which the thyroid gland is implicated, so that the estimation of the basal metabolism comes to be of importance in all cases of that kind. The subject has been developed most extensively by investigators in the States, and statistics (Levin[5]) and experience go to show that goitre of all kinds is decidedly more common along the Great Lakes and in the 'Pacific North-west' (Else[6]) than with us.

Modes of Measurement of Heat Output. Of the various methods which have been advocated, some are only feasible in special and well-equipped physiological laboratories. Special accommodation, special technicians, and other facilities become necessary. The more elaborate appliances also entail the use of calculations which are formidable even when simplified by logarithms and calculating tables (among which those of Boothby and Sandiford[7] are most ingenious). The simpler methods of analysis, in which the apparatus is portable, are apt to sacrifice accuracy to simplicity, as Benedict warns. There are, however, some instruments on the market which can be used readily, especially those which are devised to show direct readings.

The heat output may be measured in one or other of the following ways: (1) By quantitative estimation both of the oxygen taken in and the carbon dioxide exhaled. This method is adopted in the Benedict universal apparatus, in the Douglas bag method, and in the methods employed by Fleming[3] and at the New York Post-graduate Hospital[6] (e.g., *Fig.* 11). (2) By quantitative estimation of the amount of carbon dioxide eliminated (King's method[8]) (*Fig.* 12). (3) By measuring the amount of oxygen used up in a given period of time; this principle is employed in the following forms of apparatus: the Collins-Benedict,* the Sanborn-Benedict, the 'Metabolor', the Sanborn 'Handy', and the 'Guthrie'.[9] (4) By measuring the time occupied in consuming one litre of oxygen (Jones's metabolimeter[10]).

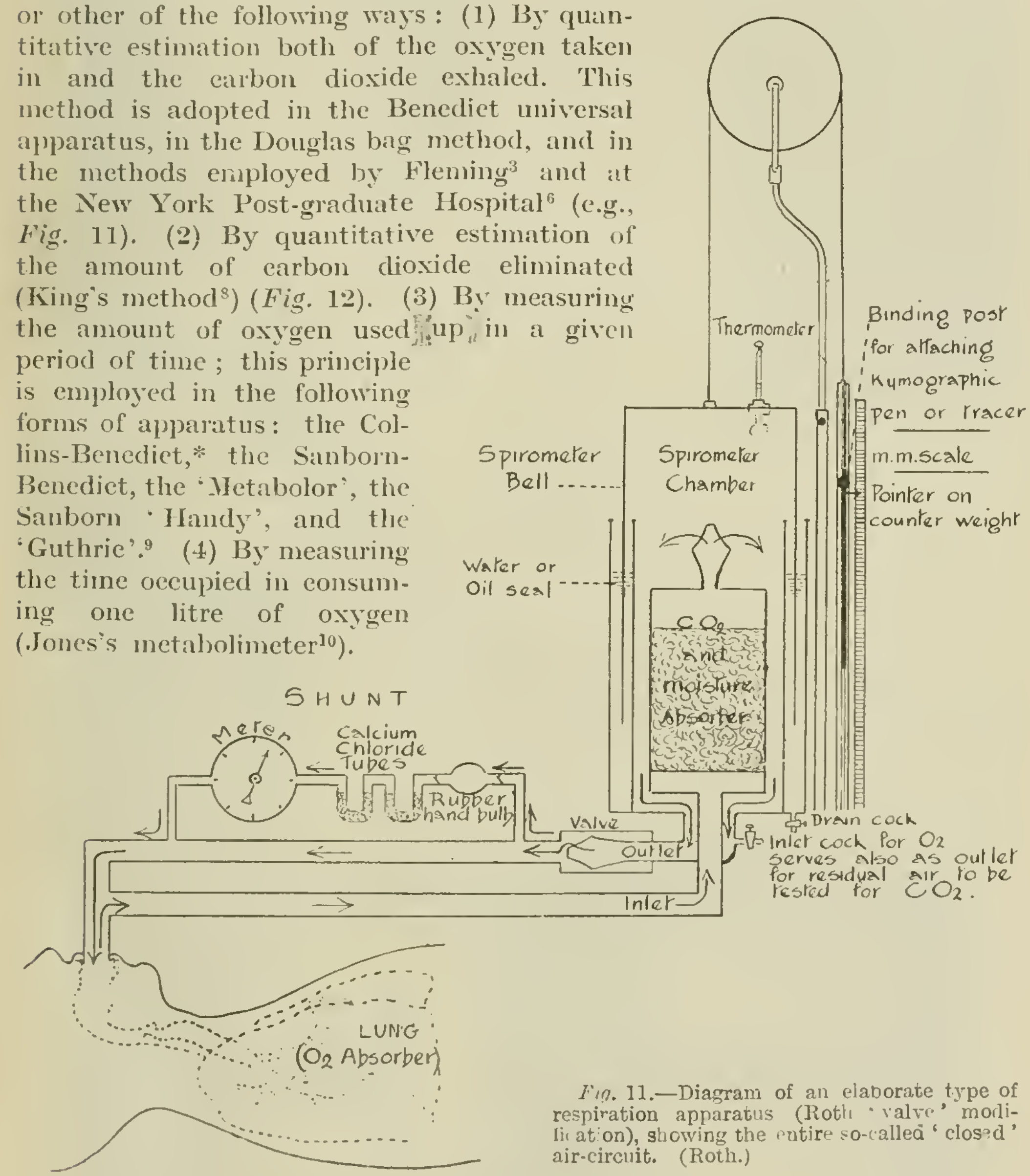
Thermometer
Binding post for attaching Kymographic pen or tracer
m.m. scale
Pointer on counter weight
Spirometer Bell
Spirometer Chamber
Water or Oil seal
$CO_2$ and moisture absorber
SHUNT
Meter
Calcium Chloride Tubes
Rubber hand bulb
Valve
Outlet
Inlet
Drain cock
Inlet cock for $O_2$ serves also as outlet for residual air to be tested for $CO_2$.
LUNG
($O_2$ Absorber)

*Fig.* 11.—Diagram of an elaborate type of respiration apparatus (Roth 'valve' modification), showing the entire so-called 'closed' air-circuit. (Roth.)

The choice of method depends partly on the ease of arriving at the result, partly on the cost of the apparatus, and partly on the facility with which a patient can use it. There does not appear to be any very important difference in accuracy. The patient may therefore be made the deciding factor. The estimation, like all modern methods of pre-operative study, is a source of trouble to the patient, and therefore preference might wisely be given to an

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* Used by Professor Cathcart[29]; obtainable through Messrs. Thomson, Skinner and Hamilton, Glasgow.

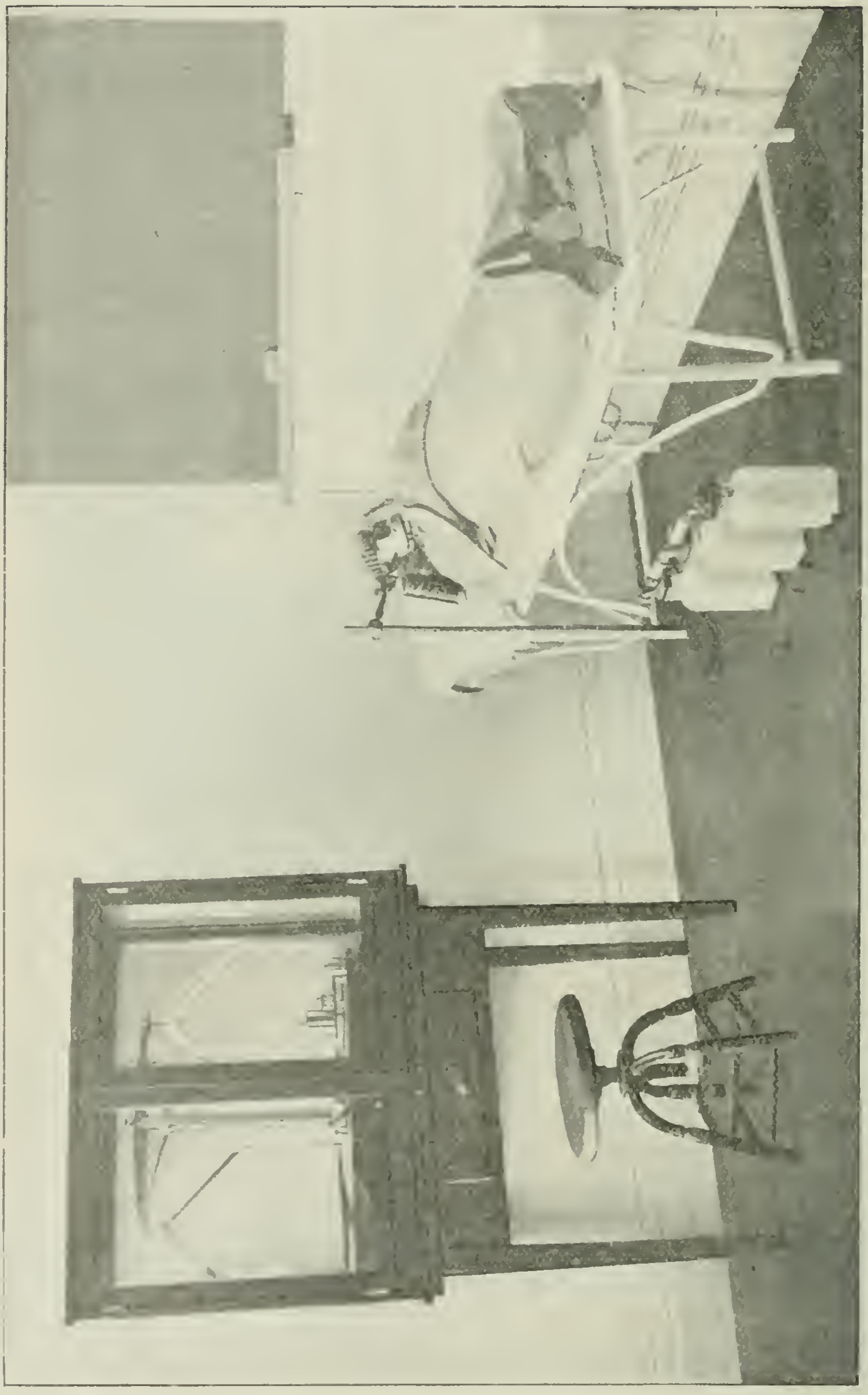

*Fig.* 12.—Apparatus and balance for measuring carbon-dioxide elimination. (King's method.)

instrument the employment of which is as little disquieting as possible. Both Jones's and King's instruments possess this merit. *Fig.* 12 shows the latter in use. The patient has nothing to do but breathe quietly through the mouthpiece. He can therefore be assured he is breathing 'fresh air',[8] and he cannot hear and need not see anything to disturb his mental equilibrium. On the other hand, the use of an instrument which enables a kymographic record to be taken at the same time[11] has very definite advantages in a hospital, though the appliance at once becomes necessarily very imposing (*Fig.* 11). In all cases the respiratory gases are collected and measured—sometimes by a gas-analysis apparatus, sometimes by noting the increase in weight of soda-lime.

*To the patient* it involves taking no food from early in the evening before : not even a drink of water must be taken on the morning of the analysis. The (nude) weight must be taken, and the height (in stocking feet), the sitting height,[2] and the sitting height to the suprasternal notch, and also the temperature and pulse-rate. He then lies down absolutely quiet for a minimum of thirty minutes. The object of the experiment should be suitably explained, as it is always easier to use a new apparatus when one knows exactly what one is to do with it. It involves wearing a nose-clip, a mask, or a mouthpiece within the mouth for ten minutes. There is then a rest for five minutes, and then a repeat for ten minutes. This is the end of the experiment as far as the patient is concerned. It is better to repeat an analysis next day and the day after, if possible. It is a counsel of perfection to suggest that the vital capacity should also be measured. It is not proposed to describe the details of any of the methods or to show how the calculations are arrived at. For such information the reader is referred to a very excellent handbook published by the Sanborn Company.[6]

THE INFORMATION GAINED FROM A STUDY OF BASAL METABOLISM.—From the standpoint of pure physiology, the investigation of basal metabolism enables us to gauge the food requirements of different individuals at different pursuits. Thus Cathcart and Orr[12] determined the dietetic requirements of the recruit in training. A chart given by Fleming[3] shows that the requirements of different occupations go in the following order from lowest to highest : tailor, shoemaker, carpenter, stonemason, wood-sawing. In regard to disease, the two outstanding features are : the great increase in metabolic rate in diabetes, and the lesser but marked increase in cases of thyroid over-activity. The increased output in fever[13] is relatively much less than in these two conditions. Du Bois pointed out that the increase of metabolism in cases of fever follows Van't Hoff's law of the velocity of chemical reactions. The rate is doubled with every 10° rise of temperature.[14, 15, 16, 17]

*Thyroid Disease.*—The most eloquent appeal for the study of basal metabolic rate in thyroid disease is made by Rowe,[6] and it is generally accepted that this study is a valuable aid in many problems of diagnosis in which the question of thyroid dysfunction arises. The chief positive points are as follows : The basal metabolic rate is increased in thyroid disease, but not in neuroses and early tuberculosis, which may clinically simulate it. Cases of tachycardia show no change in basal metabolism when the thyroid is not the cause of the rapid pulse, and neurasthenia (for which early Graves' disease might be mistaken) does not alter the rate. Cases of neurasthenia in which the thyroid is enlarged owing to increase of colloid, thus simulating Graves' disease more than ever, also give a normal rate. Conversely, early Graves' disease may be mistaken for neurasthenia, but is distinguished clearly by this test.

Hyperthyroidism, which is subdivided into two main groups, true exophthalmic goitre and toxic adenoma, presents two chief forms accordingly—one in which there is a comparatively sudden onset, with frequent remissions and exacerbations; the other, in which there are no remissions, and the course is steady through a long period of years, with relatively slight exophthalmos, but a definite liability to auricular fibrillation. In each case there is a definite increase of basal metabolic rate. In the former the pulse-rate may slow down with rest in bed. In cases of cardiac failure in which the basal metabolism is high, both pulse-rate and metabolic rate slow down with rest. Cases of simple goitre show no change (Meakins[18]). Peterson and Walter[19] found that there is parallelism between pulse-rate and metabolic rate in a number of various cases (2500 observations on 1200 subjects). Read,[20] who bears out the existence of this relation, shows that hereby we are able to measure the circulatory system's response to variations in metabolic rate, especially when the blood-pressure is also measured.

The metabolic rate becomes low when there is a deficiency of thyroid secretion. Cases of myxœdema show a persistent and steady decrease, which is removed by the administration of thyroid extract. Cases of pituitary insufficiency are also accompanied by lower rate. Removal of the adrenals experimentally (Aub, Forman, and Bright[21]) is followed by a fall of basal metabolism. Addison's disease has the same effect. Tierney[6] believes that the metabolic rate is lowered also in 'gonadeal deficiency', or, speaking more generally, in polyglandular insufficiency. Else[6] gives chronic tonsillar infection as a cause of thyroid deficiency, revealed by determination of basal metabolic rate in some cases. He also shows that the rate may be low after recovering from hyperthyroidism, in the remission stages of hyperthyroidism, and (in one case) after double oophorectomy.

*Other Diseases.*—The following table (Mohler,[22] Mosenthal[23]) gives a useful summary of the findings in various diseases:—

BASAL METABOLISM (PERCENTAGE ABOVE OR BELOW AVERAGE NORMAL).

| | Least | Most |
|---|---|---|
| Normal .. .. .. | – 15 | + 15 |
| Obesity .. .. .. .. | – 14 | + 10 |
| Diabetes mellitus .. .. .. | 19 | + 23 |
| Cardiorenal disease without dyspnœa | – 10 | + 10 |
| Cardiorenal disease with dyspnœa .. | + 25 | + 50 |
| Nephritis with œdema .. .. | – 40 | + 14 |
| Nephritis without œdema .. | + 2 | + 29 |
| Pernicious anæmia .. .. | + 2 | + 33 |
| Leukæmia[21] .. .. .. | + 6 | + 123 |
| Typhoid fever .. .. .. | .. | up to + 50 |
| Tuberculosis with pyrexia .. .. | + 15 | + 35 |
| Tuberculosis without fever.. .. | – 33 | + 15 |
| Prolonged under-nutrition .. | – 30 | – 10 |
| Graves' disease: mild .. .. | + 30 | + 50 |
| ,, ,, severe .. .. | + 50 | + 75 |
| ,, ,, very severe .. | .. | over + 75 |
| Cretinism and myxœdema .. | – 40 | + 15 |
| Liver disease[25] .. .. .. | – 15 | + 15 |
| Acute arthritis[26] .. .. .. | .. | up to + 26 |
| Subacute arthritis[26] .. .. | .. | up to + 15 |
| Gout[26] .. .. .. .. | .. | no change |

APPLICATIONS TO PROGNOSIS.—The degree of hyperthyroidism may be estimated by means of basal metabolic rate determinations. Sanborn[6] records a case in which the clinical symptoms of Graves' disease were very severe, whereas the metabolic rate was hardly changed. The prognosis was therefore made accordingly. The degree of toxicity of adenoma of the thyroid is manifested in the same way, although a toxic adenoma may be viewed as simply a form of hyperthyroidism, whose severity is estimated in this way whatever name be given to the condition. Crile[14] does not approve of classifying goitres according to the metabolic rates, and he points out that the rate gives no information about the reserve in the myocardium, liver, and central nervous system—on which surgical success depends.

Applications to Treatment.—Treatment by $x$ rays or by surgery may be advised or regulated according to the information given by this test. If the metabolic rate falls under treatment it is a sign that the $x$-ray course may be modified, whereas if a rise occur after a remission in treatment the rays should be resumed. Over-dosing must be guarded against. In regard to operative treatment, it has been thought that a very high rate is a contra-indication. As Crile[14] has said, the true guide for projecting a surgical operation is the judgement of the surgeon, but Rowe[6] points out that a reduction of a high rate by $x$-ray therapy as a preliminary to operation is a wise procedure. Adenomatous thyroids must be treated surgically. Frazier and Adler[27] apply basal metabolism estimation in the following ways: (1) To eliminate those cases which will not be benefited, but might become worse by operation; (2) To offer confirmatory evidence of the degree of toxicity; (3) To offer a quantitative rather than a qualitative index for use in diagnosis, prognosis, and treatment; (4) To enable an idea to be formed as to how much thyroid tissue may be removed. If the rate falls below −10 after operation, the case should be treated for hypothyroidism.

Conclusions.—Means[28] emphasizes the distinction between a study for practical purposes and a study merely for research. The determination of the basal metabolism has greater bearing on the latter than the former. He concludes his comments on this work by confining its value solely to the subject of thyroid disease. Here, again, its value is chiefly that it enables an opinion to be formed as to the severity of the disease. It differentiates effort syndrome from mild hyperthyroidism, toxic from non-toxic goitres and borderline hypothyroid conditions. It also shows whether obesity is or is not due to thyroid deficiency, for, unless it is, thyroid medication would simply convert the patient into a hyperthyroid. One evil would be relieved by creating another. Thyroid should never be given except to persons exhibiting subnormal metabolism. In all other directions the work has the dignity merely of scientific research.

In striking this note, the warning is given not to use this new clinical weapon indifferently like a new toy, or to impress a patient falsely with the idea that precision and exactness are being employed for his benefit. Furthermore, it may be remembered that after all we are only observing the physiological processes with a new sense; the processes are the same, and are still well understood by acumen and clinical judgement. All disease may be classified according to the effect on the metabolic rate, but it is not necessarily practical to do so; nor is the picture thus created anything but a restatement of the picture we should already have. We may enter an entirely foreign country with a language strange to us, wishing to explore it and study it, and yet in the end we shall only find exactly the same problems and social states and intricacies which we have in our own; it is the different dress that is apt to mislead. So, too, to speak in terms of metabolic rates bears the impress of something new without necessarily belonging to anything but what the clinician may already be well aware of, and be able fully to express in his own language.

Postscript.—At the July meeting of the British Medical Association, Professor Cathcart opened a discussion on basal metabolism with a paper[29] in which was emphasized the need of caution in interpreting the laboratory findings. The final figure obtained by the metabolism experiment is the outcome of "many components, the result of innumerable activities, the summation of many and varied metabolisms". It does not follow, because a patient has been recumbent for a certain period before the test is done, that he is necessarily 'at rest'. The work which he may have been doing for some days previously may still be modifying his metabolic rate. Moreover, the relation between the two distinct types of muscular activity and the basal rate is not as yet established.

References.—[1]*Jour. Amer. Med. Assoc.* 1921, July 23, 247 ; [2]*Ibid.* 250 ; [3]*Glasgow Med. Jour.* 1921, Dec., 337 ; [4]*Jour. Amer. Med. Assoc.* 1921, July 23, 252 ; [5]*Amer. Jour. Physiol.* 1921, lv, 295 ; [6]*Basal Metabolism* (Sanborn Co., Boston), 1922 ; [7]*Boston Med. and Surg. Jour.* 1921, Sept. 22, 337 ; [8]*Johns Hop. Hosp. Bull.* 1921, Sept., 277 ; [9]*Arch. of Internal Med.* 1921, Dec., 841 ; [10]*Jour. Amer. Med. Assoc.* 1920, lxxvii, 538 ; [11]*Boston Med. and Surg. Jour.* 1922, April 13, 491 ; [12]*Energy Requirements of the Recruit in Training* (H.M. Stationery Office), 1920 ; [13]*Arch. of Internal Med.* 1922, May, 567 ; [14]*Jour. Amer. Med. Assoc.* 1921, July 30, 352 ; [15]*Arch. of Internal Med.* 1922, May, 608 ; [16]*Jour. Amer. Med. Assoc.* 1921, July 23, 252 ; [17]*Ibid.* July 30, 378 ; [18]*Edin. Med. Jour.* 1922, Jan. 4 ; [19]*Jour. Amer. Med. Assoc.* 1922, Feb. 4, 341 ; [20]*Ibid.* 1922, June 17, 1887 ; [21]*Amer. Jour. Physiol.* 1921, lv, 293 ; [22]*Therap. Gazette,* 1921, Oct., 690 ; [23]*Med. Clinics North America,* 1921, March 4, 103 ; [24]*Boston Med. and Surg. Jour.* 1921, Dec., 785 ; [25]*Arch. of Internal Med.* 1921, Aug., 173 ; [26]*Ibid.* 1922, May, 583 ; [27]*Amer. Jour. Med. Sci.* 1921, July 10 ; [28]*Jour. Amer. Med. Assoc.* 1921, July 30, 341 ; [29]*Brit. Med. Jour.* 1922, Oct. 21, 747.

## BERI-BERI.

*Sir Leonard Rogers, M.D., F.R.C..P, F.R.S.*

C. A. Sprawson[1] has studied the cardiac conditions in beri-beri in the Chinese in Mesopotamia, and found evidence of cardiac dilatation and myocardial degeneration, in the detection of which Leyton's differential stethoscope was of value, as in 17 of 55 cases the ratio of intensity of the first sound at the apex to that of the second sound at the base was under 1·5 to 1, and in 36 cases it was below the normal of 2 to 1.

Reference.—[1]*Ind. Jour. Med. Research,* 1922, Jan., 625.

## BILE TRACTS, SURGERY OF. (*See* Gall Tracts.)

## BILHARZIASIS.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Etiology.—G. Z. L. Le Bas[1] has investigated the complement-fixation test for bilharziasis, and points out that the active alcoholic extract of the antigen used by Fairley was obtained by the use of such a small quantity of absolute alcohol that it was diluted with the fluids of the snail. She found that extracts in a larger quantity of alcohol and in acetone were inactive, but one made with 50 per cent each of alcohol and saline was quite active, and she concludes that the active substance is a class of proteid. The literature of the subject is also well summarized in this paper.

J. H. H. Pirie[2] finds primary carcinoma of the liver more frequent in natives than in Europeans in South Africa, which he attributes to its being secondary to cirrhosis induced by bilharzial infections, as, out of 36 primary liver carcinoma cases, in 10 schistosomiasis was definitely established, and in only 2 could it be absolutely excluded.

Prophylaxis.—M. Khalil[3] has investigated the effects of drying, and of the soil-fertilizer crude ammonium sulphate, on *Planorbis* snails and on their eggs, and found that drying for over five hours kills the eggs, and for three days the adult snails, while a 1–1000 solution of the chemical kills the eggs in six hours and the adults in twenty-four hours. These experiments support the suggestion of Leiper to deal with bilharziasis in Egypt by destroying the intermediate host of the parasite in the canals, whose water is under control.

F. G. Cawston[4] advises removal of rushes from the banks of snail-infested rivers, the keeping of ducks, and where necessary the addition of lime or copper sulphate to the water, the latter in the strength of 1–500,000 being said to destroy most snails. S. B. Jones[5] has met with a number of cases of bilharzial disease in the West Indies, mainly from French St. Martin, due to *S. mansoni*.

TREATMENT.—D. M. McWhae and T. R. Jagger[6] report on eleven cases from Egypt in soldiers isolated in Western Australia, and treated effectively with **Tartar Emetic** in the usual way to prevent the spread of the disease. H. K. Pavy[7] reports similar measures in South Australia in which cure was obtained with an average amount of 27 gr. of the same drug, the improvement in the symptoms being accompanied by a rapid decrease in the eosinophilia.

H. F. Wilson[8] has found tartar emetic administered rectally efficacious in bilharzial disease, apparently reaching the parasite directly in the portal vessels through absorption by the hæmorrhoidal veins. A mild laxative was given overnight. and, some three hours after the morning motion, the dose, dissolved in one or two ounces of warm water, was run into the rectum, the patient being kept lying down for about two hours. The drug was given every second day, beginning with 1 gr. and increasing by 1 gr. at each injection up to 12 gr. in children, while in an adult successive doses of 5, 8, 10 and 12 gr. were given. Four successful cases were recorded. The method is of special value in children with small veins, and may greatly simplify the use of the drug in them.

F. W. Cawston[9, 10] reports further on **Antimony** and **Emetine** in this disease. He found no advantages in colloidal preparations of antimony, and warns against their instability in some instances, while colloidal manganese had no effect on the bilharzial worms. He found emetine of use in children, beginning with $\frac{1}{3}$ gr. and working up to 1 gr. in those of 10 years of age, but stopping or reducing the dose if any toxic signs ensue, as the drug is cumulative; the doses are given intramuscularly daily for three days, and then three times a week for three weeks. In a further series of papers,[11] the same writer suggests that certain large-sized apical-spined ova found rarely in man may be those of *S. bovis* of sheep, and records yet further cases treated with the now well-established **Tartar Emetic** method.

REFERENCES.—[1]*Jour. Trop. Med. and Hygiene*, 1922, 49; [2]*S. Afric. Med. Record*, 1922, 2; [3]*Jour. Trop. Med. and Hygiene*, 1922, 67; [4]*Ibid.* 16; [5]*Ibid.* 25; [6]*Med. Jour. of Australia*, 1921, Sept. 17, 217; [7]*Ibid.* Aug., 155; [8]*Brit. Med. Jour.* 1922, i, 137; [9]*Lancet*, 1921, ii, 1049; [10]*Jour. Trop. Med. and Hygiene*, 1922, 112; [11]*Ibid.* 242, 155, and 267.

## BILIARY DRAINAGE (NON-SURGICAL). *Robert Hutchison, M.D., F.R.C.P.*

The **Meltzer-Lyon Method** of draining the biliary passages has excited a good deal of attention in America in the last few years, and already a considerable literature dealing with it has sprung up. It has not been much used in this country as yet, but Professor Meakins,[1] of Edinburgh, has described his experience with it in a paper which forms the foundation of this review. Meltzer,[2] in 1917, observed that the application of a 25 per cent solution of magnesium sulphate to the mucosa produces a complete local relaxation of the intestinal wall, but that such a result is not obtained if the salt passes through the stomach. He suggested that the application of such a solution by means of the duodenal tube might relax the sphincter of the common bile-duct and allow of the escape of bile. Lyon[3] adopted the suggestion and developed the technique of its application to the human subject, and it is to him and his co-workers that the establishment of this new method of clinical investigation in cases of disease of the biliary passages is due. Meakins describes the method of carrying out biliary drainage as follows:—

The patient should fast for at least six hours before the duodenal tube is introduced. The tube is then passed to the first mark (40 cm.). The stomach contents are then aspirated by means of a glass syringe. If the stomach be normal, they will be found to consist of slightly opaque acid fluid with flakes of mucus ; this is quite typical of the resting gastric juice. It is well to examine this material, when obtained, as to its total acidity, for frequently useful information may thus be obtained. The stomach is then washed out with 30 c.c. of tepid water, which is introduced by syringe and withdrawn. This repeated process need not be prolonged if the stomach appears normal. The patient is now placed on the right side in the recumbent position. The duodenal tube is then passed to the second mark (55 cm.), and the process of washing and evacuation repeated two or three times. The tube is finally introduced to the third mark (80 cm.), where it is allowed to remain. The patient is kept lying on the right side with the abdomen inclining towards the bed, although it is not found advisable that he should lie too flat on the abdomen. It is important that the patient should be made as comfortable as possible, in order that restlessness and fatigue may be avoided. The patient remains in this position for about half an hour, when a small sample of the contents of the gut is removed for examination. If the end of the tube be in the duodenum, the fluid withdrawn may be scanty, alkaline or neutral, and at times more or less bile-tinged. If it contain free hydrochloric acid (indicated with Congo-red paper), it may be presumed that it has not yet passed the pylorus, or at the best is just within the duodenum.* Each fifteen minutes following, a small sample of the contents is obtained for examination. When these samples are alkaline or neutral and probably slightly bile-stained, it may be concluded that the end of the tube is well into the duodenum. This usually takes from three-quarters of an hour to an hour, but sometimes longer. In a certain number of cases it may be impossible to obtain an alkaline or neutral sample. If the resting gastric juice has been examined, a high degree of acidity may frequently have been found in such cases. If the final samples remain acid but with a lower concentration of titratable acid than that of the resting gastric juice, it may be presumed after two hours that the tube has reached the duodenum, especially if the fluid be bile-stained. Subsequent events will indicate whether this be so or not.

When it has been decided that the tube is in the duodenum, 30 c.c. of a 25 to 50 per cent solution of magnesium sulphate is injected through it. This is allowed to remain for five or ten minutes, when a sample may be removed. If the procedure has been successful, the fluid will be found to be deeply bile-stained ; and if the withdrawal be continued at intervals, almost pure bile may be obtained. If diagnosis be the principal point in view, the bile may be withdrawn in fractional amounts and placed in numbered test tubes, and subsequently examined. If, however, drainage or thorough evacuation of the gall-bladder be the primary object, then persistent withdrawal of the bile is not required, and the contents (magnesium sulphate and bile) of the duodenum may be allowed to pass down the bowel. In these circumstances care must be taken not to introduce too much magnesium sulphate, as violent purging may then result.

In the practice of a busy practitioner, where a nurse skilled in the procedure is not available, or in the wards of a hospital where a number of patients are treated each day by this method, the steps outlined above may be too time-consuming. The following plan may therefore be adopted : The tube is passed the night before to the 80 cm. mark, a spring clip being attached to the free end in order to prevent leakage, and pinned to the nightdress. The patient is then instructed to sleep on the right side. If there be restlessness and difficulty in sleeping, 1 grm. of sodium or potassium bromide, or an equivalent amount of some mild hypnotic in solution, may be introduced into the stomach through the tube, which may be completely emptied by injecting a few cubic centimetres of air. A good night's rest is thus usually obtained. At a convenient hour in the morning a small sample of fluid is withdrawn. Only exceptionally does this fail to give positive evidence of coming from the duodenum. The magnesium sulphate may then be introduced. When it has been determined that the bile is flowing freely, the tube may be removed,† and after half an hour the patient may have the breakfast indicated under the circumstances of the condition, irrespective of the duodenal tube having been introduced.

The first bile to come away is of a light-golden colour, and usually quite transparent. It is spoken of as the 'A' bile, and is believed to come from the common bile-duct. It is followed by a larger quantity of a dark greenish-yellow bile, which is much more viscid. This is the 'B' bile, and presumably (though some observers do not admit this) arises from the gall-bladder. Lastly, a smaller quantity of paler and thinner bile is obtained ('C' bile), which is supposed to come from the intrahepatic ducts.

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* The passage of the tube into the duodenum may be hastened by having the patient drink about 150 c.c. of hot clear meat soup or milk. The latter is to be preferred, as it does not obscure the future colour indications. This drink should be taken before the tube is introduced to the second mark, and therefore the second washing and evacuation of the stomach is omitted.

† It is usually advisable in infected conditions of the biliary tract to lavage the duodenum with a bland aseptic solution before the removal of the tube.

If the suppositions as to the site of origin of each of the varieties of bile are correct, and if contamination in the duodenum can be excluded (a rather large assumption), then it follows that by a careful macroscopical, microscopical, chemical, and bacteriological study of the different samples, much information may be obtained as to the presence or absence of disease in the different sections of the biliary tract. The abnormalities in the bile to be looked for are: increased viscosity and turbidity, presence of flakes of mucus, pus-cells, large numbers of degenerated epithelial cells, and pathological micro-organisms such as streptococci, staphylococci, *B. typhosus*, or large numbers of *B. coli*. Biliary sand or even small gall-stones may also be observed. The diagnosis of the nature and site of the local lesion will depend upon the degree and character of these abnormalities in each variety of bile.

It will have been observed that the method is not one which is altogether easy to carry out, and much time and care must be bestowed upon the examination of the bile obtained if trustworthy conclusions are to be drawn from it. Lyon does not indeed pretend that it is a method capable of being used in a routine fashion by everyone, and already there is a good deal of conflict of opinion as to the significance to be attached to some of the abnormalities in the bile which it reveals.[4] Enough experience, however, has accumulated to prove that it is a valuable addition to our methods of clinical investigation in cases of disease of the biliary system. Further, it has also proved of considerable use in the treatment of cases of biliary stasis, by enabling us to bring about free and periodical emptying of the gall-bladder and bile-passages. It is incapable, of course, of replacing operation as a method of dealing with organic obstructions; but in functional cases of stasis, especially of a catarrhal nature, or in those organic cases in which for any reason operation is contra-indicated, experience shows that it is capable of affording considerable relief. Whether the relief so obtained is permanent, time alone will show.

The following summary of a paper by Franklin W. White[5] seems to be a judicial estimate of the uses and limitations of the method. He says:—

The profession owes Meltzer and Lyon a debt for their stimulation of the study of the liver. They have made us think, and have given us a new method. The early papers seem over-enthusiastic and dogmatic, and say too little about the limitations and difficulties of the method. We cannot agree with them in detail. The physiology of the method, the cause of the colour change, the action of $MgSO_4$ on the gall-bladder, the segregation of the bile, need further study in normal individuals or animals to give a firm foundation for clinical and diagnostic work.

*Its use for diagnosis* has its difficulties and limitations. It is somewhat elaborate and time-consuming, consisting of intubation, lavage, aspiration, microscopical examination, cultures, etc., but it can be carried out on nine-tenths of the patients chosen for examination. It requires repetition of the drainage and also the use of the *x* ray for the best diagnostic work, although much diagnosis and most treatment can be done without the *x* ray. The segregation of the bile, and the study and interpretation of the cells and bacteria, present difficulties, most of which can be overcome by experience. The pathologic area may be blocked off by obstruction, e.g., of the cystic duct, and the drainage not be very abnormal in an important case.

In spite of these limitations, the method has proved useful, and sometimes very useful, in diagnosis. It helps to show whether the ducts are open or closed. If no dark or 'B' bile is obtained on repeated drainage, properly performed, we may suspect cystic-duct obstruction, frequently with gall-stones. If *no bile* is obtained with a proper drainage, but pancreatic ferments or blood are found, common-duct obstruction is present, frequently malignant. *Cholecystitis* and *cholangitis* cases, unless marked obstruction exists, usually give a bile which is abnormal in colour, appearance, cells, mucus, and bacteria. Gall-bladder sand may aid in the diagnosis of *gall-stones* ; but, in general, the drainage in gall-stone cases was not characteristic.

*In treatment*, it is logical to combat biliary stasis, the well-recognized forerunner of biliary catarrh, infections, and stones. We are not sure, at present, how completely this method empties the biliary passages in all cases, but in many it appears to do this very well. The best field for its use is in the milder and moderate grade of *cholecystitis* and *choledochitis* cases, where no marked obstruction exists. Many such cases are greatly relieved, or apparently cured, following this treatment. It is obviously unsuited for treatment of acute, virulent infections of the gall-bladder, acute or chronic empyema, gangrenous cholecystitis, or cases with known stones or tumour, or severe chronic obstructive cases which will not drain. It may be occasionally useful in some of these cases when surgery is contra-indicated, as in old people, or in cardiac, renal, or diabetic patients.

References.—[1]*Brit. Med. Jour.* 1922, June 24, 983; [2]*Amer. Jour. Med. Sci.* cliii, 1917, 469: [3]*Jour. Amer. Med. Assoc.* lxxiii, 1919, 980; [4]Baskell, Luckett, and Lutz, *Amer. Jour. Med. Sci.* 1921, Nov., 674; [5]*Boston Med. and Surg. Jour.* 1922, Feb. 16, 206. Those who are interested in the subject will find further records of experience with the method in the following papers: Crohn, Reiss, and Radin, "Experiences with the Lyon Test", *Jour. Amer. Med. Assoc.* 1921, June 4, 1567; Smithies, Krashner, and Oleson, "Non-surgical Drainage of the Biliary Tract", *Jour. Amer. Med. Assoc.* 1921, Dec. 24, 2036; Lyon, Bartle, and Ellison, "Biliary Tract Disease: Some Lessons learned from Duodenobiliary Drainage", *Amer. Jour. Med. Sci.* 1922, Jan., 60; McCaskey, "The Clinical Study of the Biliary Secretions Obtained by Non-surgical Drainage", *N.Y. Med. Jour.* 1922, June 21, 747; and Lyon, "A Reply to Certain Antagonistic Criticisms of Non-surgical Biliary Tract Drainage", *Ibid.* 1922, March 1, 369.

## BLACKWATER FEVER. (*See also* Malaria.)

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

C. M. Wenyon,[1] in an account of his war researches in Macedonia (*see* Malaria), states that blackwater fever was not uncommon, and the war experience emphasized more than ever its close relationship to malaria, and established that it is something more than mere quinine poisoning, although a certain number of cases follow large doses of that drug. It may occur in very acute cases in which the destruction of the red corpuscles by the parasites is too much for even the liver to convert into bile, so it escapes through the kidneys, which are damaged in the process. The development of malarial parasites in mosquitoes is also dealt with.

N. Crichlow[2] writes on this complication of malaria in the Solomon Islands, where he thinks it has recently appeared, for which reason he believes it to be distinct from malaria, although he mentions that malignant tertian malaria, to which it is nearly always secondary in other countries, has also become comparatively common there recently. A considerable proportion of the recent deaths among Europeans on the Islands have been due to the disease.

Treatment.—Crichlow advises warmth in bed, mild diet with abundant fluids and salines rectally or subcutaneously, and **Quinine** as soon as the urine becomes clear. [It is remarkable how the principal advocates of the non-malarial nature of blackwater fever, including Manson himself, advocate quinine in its treatment.—L. R.]. **Methylene Blue** was used with apparent success in one case.

REFERENCES.—[1]*Jour. R.A.M.C.* 1921, 82; [2]*Jour. Trop. Med. and Hygiene,* 1921, 231 and 255.

## BLADDER, DISEASES OF.

*Sir John Thomson-Walker, F.R.C.S.*

### THE TRIGONAL MUSCLE.

According to Young and Wesson,[1] the trigonal muscle is a definite entity continuous with the longitudinal fibres of the ureters and superimposed on the muscles of the bladder wall, and the opening of the internal urinary meatus is primarily the result of its contraction, because its fibres pass through those of the weaker internal sphincter, pulling this sphincter open mechanically. When the trigonal muscle is removed, micturition is difficult and incomplete; with removal of one half, the remaining half functions, and the bladder can be emptied completely.

### DIVERTICULA.

Lower[2] considers that there is a congenital predisposition to the formation of bladder diverticula, but that their clinical recognition is hastened and their dimensions are greatly increased by any factors bringing about increased vesical distention, or increased activity of the bladder musculature. He considers the fact that diverticula usually occur in male patients past middle age, with the concomitant presence of obstruction, supports this theory. The increased intravesical pressure occurs as a predisposing factor, not only as the result of urinary obstruction, but also, he states, in cases in which an overdistended condition of the bladder is due to failure to empty it at regular intervals. He quotes two striking examples of diverticula apparently due to the latter condition. Both patients were mail carriers, and each attributed his difficulty to the fact that on the mail route it was not always convenient to empty the bladder, and consequently he had held his urine much longer than he would have done under ordinary conditions.

Diagnosis is made by cystoscopy and cystography, and confirmed by cystotomy. The symptoms are indefinite, but persistent pyuria, with difficulty and frequency of micturition, especially if the urine is very foul, are suggestive. The author recommends **Radical Excision**, with the removal of any associated cause of urinary obstruction. The suprapubic route is preferred, approaching the diverticulum intravesically, packing it with gauze, separating the tumour so formed from the perivesical structures, then excising the diverticulum and closing the bladder wall in two layers, invaginating the suture line. The prevesical space is drained, and an indwelling catheter is retained for several days. If necessary, ureteral transplantation is done.

### EXTROVERSION.

Mayo,[3] in a review of 72 cases of exstrophy of the bladder seen at the Mayo clinic, 36 of which were operated upon, 29 successfully, with a mortality of less than 20 per cent, states that this condition is a very rare anomaly resulting from failure of the maternal placenta properly to remove embryonic residues from the fœtal circulation during the renal functional change from Wolffian body to kidney. If the embryonic bladder is not developed sufficiently to cope with this premature function, it probably splits its anterior surface including the urethra and the hypogastric canal to the umbilicus. In the early cases the method of Maydl and Moynihan was employed, but patients operated upon later have been treated by Coffey's method of transplanting the ureters into the sigmoid colon by a two-stage operation, and then complete cystectomy with closure of the wound by fascia as a third and last stage. The dangers are: (1) Peritonitis; (2) Ascending renal infection from the bowel. The best time for operation is between 5 and 10 years of age. Of the 27 cases not operated upon, most were too young; a few were too old or had renal complications. If the condition is left alone, 75 per cent die before the age of 30.

London and Newland[4] describe the after-results in two cases of extroversion of the bladder in which an extraperitoneal implantation of the ureters into the rectum had been performed some years previously. The first patient, operated upon in 1899, at the age of 9, remained well until 1908, and could always hold his water in the rectum all through the night. During the next ten years he had occasional bouts of illness, rigors, vomiting, pains in the loins and groins, and occasional diarrhœa, with, at times, tenderness over the right kidney. In January, 1918, he contracted influenza, and from that time began to go downhill; he developed marked œdema, and later vomiting, and in December, 1920, he died. The left kidney was shrunken, tough, with wasted cortex, and dilated calices filled with greenish putty-like material; the ureter varied in calibre, but was strictured and kinked just above its entry into the rectum two inches above the anal margin. The right kidney was somewhat dilated, and filled with fæcal-smelling, semipurulent material; the whole ureter was slightly dilated, and opened into the rectum three inches above the anus.

The second patient, operated upon in 1904, remained well until 1920, when he began to complain of weakness, abdominal pain, and cough without hæmoptysis. No pulmonary or laryngeal condition was found. He had complete control over his urine, and could pass it irrespective of defæcation. The urine was turbid and contained a good deal of albumin, but the kidneys were neither tender nor enlarged. In a few months he developed definite signs of pulmonary tuberculosis, and died in January, 1921. No post-mortem data were available in this case.

Denel[5] has re-examined 5 of the 11 patients treated in Eiselsberg's clinic for exstrophy of the bladder since 1901, of whom 4 died in less than two weeks, and 1 in twenty-eight months. In none was the incontinence cured, and in only one did the fistula finally close, despite repeated plastic operations. Of 400 Maydl operations on record, the mortality in patients under five was 41, between six and ten only 18 per cent, and over twenty from 50 to 72 per cent.

If no attempt is made to cure the incontinence, the danger of ascending nephritis can practically be excluded by implanting the ureters in the penile groove, or by making a ureteral fistula in the lumbar region or in the anterior abdominal wall.

### Contracted Bladder.

Frontz,[6] in a clinical and pathological study of this condition—decreased bladder capacity—states that it may be due to lesions of different kinds. The majority of bladder infections are secondary either to obstruction, with or without residual urine, or to some extravesical focus. The bladder shows a remarkable ability to eliminate infection after removal of the primary source. This is so marked that the existence of a primary cystitis has recently been questioned. But, after all outside foci have been eliminated, there remains a fairly large group of cases in which bladder infection does not disappear spontaneously, but will clear up under suitable treatment. The cystoscopic picture in this group shows much variation: localized or diffuse congestion of the mucosa, areas of bullous œdema, papillary formation, and erosion or actual ulceration; there may be in the same bladder a combination of all these lesions. Such findings usually signify a mucous-membrane lesion only, giving no index regarding the degree or depth of the inflammatory process in the bladder wall. If the lesion is superficial and confined to the mucosa, it will usually disappear under local treatment, such as irrigations or instillations, the more refractory being benefited by the application of strong solutions of silver nitrate. Where, however, this is difficult or impossible, daily hydraulic distention yields good results, when combined with an attempt to increase the bladder capacity.

When, however, after the above treatment, recontraction of the bladder occurs, it is probable that the deeper layers of the bladder wall are involved. In cystitis with involvement of the mucosa, blood, pus, and bacteria are present in the urine, in striking contrast to the urinary findings in cases in which the lesion is largely submucous. In the latter the symptoms may be most severe and yet changes in the urine be slight or absent.

In 1913 Hunner reported a group of such cases under the title "Elusive Ulcer of the Bladder". The author has collected 26 cases treated during the past five years in the Brady Urological Clinic; 1 was under twenty years of age, 4 between twenty and thirty, 6 between thirty and forty, 7 between forty and fifty, 8 between fifty and sixty. All presented frequent and painful micturition; in 11 the frequency amounted to almost incontinence, and was present both day and night. In 4 there was contracture of the vesical orifice, with definite obstruction to micturition; in 2 there was interrupted micturition, probably due to spasm of the vesical sphincter. Severe cutting suprapubic pain was common to all when the bladder was distended; in many this was worst at the beginning of micturition, while others felt a burning sensation in the perineum and glans at the end of the act which sometimes persisted for several minutes. Hæmaturia, independent of instrumentation, was present in 7 cases, variable in degree. In 10 the urine was negative for pus and bacteria, in 4 a few leucocytes and red blood-cells were found on centrifuging; the remaining 12 cases showed pus and bacteria.

On cystoscopic examination, a constant feature of all the cases was a diminution of bladder capacity, with severe suprapubic pain on distending the bladder. The appearance of the lesion varied considerably; in 20 the change in the mucosa was very slight. A slight or intense reddening of the mucosa, from a few millimetres to several inches in diameter, was frequently all that could be seen. In other cases, close examination showed a definite puckering, indicating a fibrous change in the submucosa, the centre of the lesion being paler than the periphery. When a bladder, the seat of such a lesion, was well distended, bleeding at the site of the lesion invariably occurred, and the previously intact mucosa showed bleeding fissures, which at subsequent examination were covered with mucopus. In cases with infected urine, ulceration tended to develop at this point. In 4 cases definite ulceration was noted. In 3 cases bladder contraction was extreme, the bladder capacity being less than 30 c.c.; and on introducing more fluid, bleeding occurred. From the view obtained, the mucosa was everywhere thickened and intensely inflamed, but no definite ulceration was noted.

As regards diagnosis, a history of long-standing frequency and suprapubic pain on bladder distention, in the absence of obstruction, is very suggestive, especially with a sterile urine. The marked contraction of the bladder, the reproduction of the pain by artificial distention, and the cystoscopic findings, complete the diagnosis. The author frequently found that many lesions which were very indefinite cystoscopically became most striking when the bladder was opened at operation. In 14 cases operated upon there was thickening of the bladder wall. In some it was extremely thick at the site of the lesion, the whole wall, and infrequently the perivesical tissues, being involved. In 8 cases the bladder wall was quite thin, being only slightly thicker at the site of the lesion, which was thus confined to the submucosa. The important lesion in all the cases studied was a fibrosis of the submucosa, the mucosa resting directly upon a dense scirrhous layer, instead of, as in the normal bladder, on loose areolar tissue, and when the bladder is over-distended in these cases the mucosa cracks, as this fibrous layer is quite inelastic. Beneath this fibrous layer there is in most cases round-celled infiltration of varying degrees of intensity, extending exceptionally as far as the serous coat, and associated with congestion, and at times extravasation of blood in the tissues.

As regards treatment, nothing short of operation has achieved any permanent results in cases in which more than the bladder mucosa is involved. If the site of the lesion allows of resection, this should be done; if, however, the areas involved cannot be removed, the author recommends deep cauterization. In doubtful cases, the effect of vesical distentions, instillations, and irrigations may be employed as a diagnostic measure. The treatment of this series was as follows: 22 were operated upon; 4 were dealt with by vesical distention, fulguration, and the application of silver nitrate to the area involved. In 15 of the operated cases resection, and in 5 deep cauterization, was employed. Of the 11 cases treated conservatively, 7 were subsequently operated upon. The results in the 15 cases in which resection was performed are as follows: 13 are relieved of pain, 7 have normal frequency of micturition, 2 have died following operation (one of bilateral pyelonephritis, the other of paralytic ileus). Of the 5 treated by cauterization, the results in 4 are encouraging; in the one failure subsequent resection was carried out. In the 4 cases treated conservatively, there has been marked improvement of the frequency and pain. The author describes 6 cases in detail.

Bumpus[7] discusses the 15 cases (13 female and 2 male) of submucous ulcer of the bladder (Hunner type) that have been operated upon at the Mayo Clinic since Dec. 1, 1916. This condition involves the mucosa only slightly, but the submucosa becomes markedly affected. The age of occurrence (average, 32), and the pathological features, such as marked vascularity, aggregation of polymorphs in the vesical walls and perivesical tissues, the diffuse submucous lymphocytic infiltration, and the extravasation of red blood-cells through the surrounding tissues, all indicate that infection is a cause. Moreover, since the perivascular changes, cellular infiltration, and œdema are most marked in the outer part of the bladder wall, and the bladder mucosa itself may show no involvement, it is probable that infection occurs by way of the blood-stream.

Eight of the patients had peri-apical infections of the teeth, shown by *x* rays. From the teeth of several were isolated bacteria which, on being introduced into laboratory animals, became located in the bladder and reproduced typical lesions. Microscopic examination of the urine was negative in 10 cases in the series, including the two males; but all gave a history of intermittent attacks of gross hæmaturia, due to the fact that over-distention and trauma cause the lesion to bleed. During cystoscopy this tendency to bleed is prominent, and together with the pain and frequency—which are severe both day and night—is pathognomonic. The fact that there are few changes in the urine suggestive of disease, tends to prevent early diagnosis. The average duration of symptoms was ten years.

Of 8 patients operated upon more than one year previously, 4 are reported as completely cured, and 4 show no benefit; in the latter there may have been a recurrence, due to foci of infection; therefore such foci should always be looked for and, if possible, removed. The two males were 25 and 30 years of age; both gave histories of previous urinary infections several years before—perinephritic abscess in one, and in the other bladder ulcers from which he had recovered. In both cases œdematous reddened areas were found in the dome of the bladder. After resection, microscopic examination confirmed the diagnosis of submucous ulcer of the Hunner type.

### CYSTITIS.

In a discussion on the diagnosis and treatment of cystitis at the Urological Section of the British Medical Association at Newcastle, Dobson[8] insisted on the importance of thorough investigation of any chronic case presenting symptoms of 'cystitis'. The disease is rarely limited to the bladder. The term cystitis should be dropped, and such cases considered as infective conditions of the urinary tract.

In the investigation, it must first be determined that there is an infection of the urinary tract. Many patients suffer from symptoms which are attributed to cystitis when the urine contains no trace of pus or organisms, and these may be due to such causes as chemical alteration in the urine, calculus in the kidney or ureter, a tumour pressing on the bladder, or even an irreducible hernia, particularly if a portion of the bladder is involved in the sac. Examinations of catheter specimens of the urine, rectal, vaginal, and abdominal examinations, *x*-ray investigation of the whole urinary tract, cystoscopy, ureteral catheterization, with complete examination including culture of the urine from both kidneys, estimation of the renal function, and in some cases pyelography, are required, as well as the routine examination of the patient. Such an elaborate, expensive, and trying investigation may well prove simpler, cheaper, and less worrying in the end.

As regards treatment, there are many cases in which the urinary infection is secondary to a definite lesion of the urinary tract or elsewhere, and the active treatment of the infective process is secondary in importance to that of the principal disease. In the majority of acute infections of the urinary tract, active surgical treatment is rarely required, and instrumentation should be deferred, reliance being placed, in the acute stages, on abundant drinks, alkalis, sedatives, and urinary antiseptics. Occasionally very acute cases occur in which necrosis of the bladder mucosa, perforation, and pericystitis threaten, and bladder drainage is urgently required; these he prefers to drain with a medium-sized suprapubic tube, using bladder instillations of **Eusol** through Carrel tubes; the one disadvantage of this procedure is that it is very difficult sometimes to conduct a satisfactory cystoscopy and ureteral catheterization until the fistula has almost closed. **Urotropine** he considers to be the only urinary antiseptic of value, and its use is greatest as a prophylactic. Bladder lavage always bears with it the danger of causing secondary infection, and is of no use until the primary focus of infection has been found and its nature determined. Its chief use is in the pre- and post-operative treatment of surgical procedures in the bladder. As an auxiliary to renal lavage it is of great value in the treatment of pyelitis and cystitis. He finds **Silver Nitrate** (1–20,000) the best solution to start with, the strength being gradually increased as required. Vaccine treatment he has found to be useless for cystitis.

Those cases of cystitis in which the presence of bacteria and pus in the ureteric catheter specimen is the only objective sign of a urinary infection, usually, but not invariably, the result of a hæmatogenous renal infection, generally recover completely with the simplest treatment, but the chronic and relapsing cases are most rebellious to treatment of all kinds; in these, improvement of the general health, treatment of any ascertained cases of chronic toxæmia, together with pelvic lavage, lead to improvement and, at times, to cure, it being most important that any contributory source of infection, such as a chronic prostatitis, be attended to.

The chief points emphasized in the discussion which followed were: In ascending infections, the most common site of infection was the prostate; in the presence of obstruction the infection might reach the kidneys, and this renal infection might persist long after the obstruction had been removed. If symptoms of cystitis persisted for a considerable time after prostatectomy, the infection was almost always renal. Many cases of recurrent infection of the urinary tract are due to a persistent focus in the prostate, and for the recognition of these the prostate should be massaged, and the fluid examined for pus and bacteria. The interaction of different bacteria is of great importance; for instance, a *B. coli* infection of the urinary tract might flare up when the patient had an attack of streptococcal tonsillitis. The possibility of direct infection of the urinary tract through the lymphatics of its wall, as from the duodenum or colon to the renal pelvis, the appendix to the ureter, or the rectum to the bladder or prostate, was important to bear in mind.

Thomson-Walker[9] mentioned that in certain cases of pyelitis he employed nephrotomy in conjunction with continuous irrigation of the renal pelvis. The kidney is exposed and stitched in position, and two small rubber tubes are passed through a single, or sometimes a double, nephrotomy wound into the pelvis. Continuous irrigation is kept up with short intervals for from six to ten days; then the tubes are removed and the kidney wound is allowed to heal. There is some danger of a urinary fistula, which may heal only with difficulty, and a possibility that a staphylococcus infection may track along the tube and replace the *B. coli* infection in the pelvis.

### TUMOURS.

Corbus[10] describes the results of five experiments in which *electro-coagulation* of the normal bladder wall of dogs was carried out. The immediate effect is a slow heat coagulation of the underlying tissues, followed by aseptic death of the mucosa, submucosa, and muscularis. Round-celled infiltration is marked only for the first three days. Eventually the entire area is replaced by fibrous tissue, and the line of demarcation is definitely preserved. The ureteral wall may be 'burned back' in the dog almost to the entrance of the intramural portion. The results in three dogs, observed for from three to five months, have shown no derangement of function in ureteral or vesical activity, and no ureteral obstruction. He discusses the treatment of bladder growths in relation to the above findings, classifying it as follows:—

1. *Benign papillomata*: If few and easily accessible, trans-urethral fulguration, followed by the transurethral application of radium as a prophylactic measure, in that all papillomata are potentially malignant.

2. *Multiple papillomata and tumours inaccessible transurethrally*: Suprapubic fulguration, followed by radium applied through the suprapubic fistula.

3. *Carcinomata*: The same as (2), except that fulguration is more extensive, and the radium is applied more intensively.

4. *Tumours involving the ureteral orifice*: Fulguration of the growth, with considerable 'burning back' of the intramural portion of the ureter and surrounding bladder wall, and subsequent application of radium.

Barringer[11] discusses the *treatment of carcinoma of the bladder by radium*, on the basis of 53 cases, of which 7 were papillomata, 18 papillary carcinoma, 22 infiltrating carcinoma, 4 adenocarcinoma of prostatic type, and 1 papillary adeno-carcinoma. Different tumours react differently to radium; two papillomata of the same microscopic structure may react quite differently. Papillary carcinoma appears to be more sensitive than papilloma, and can be destroyed for a varying period by large doses of screened radium. Infiltrating carcinoma is best dealt with by implanting, through the indurated area, small bare tubes of radium, and leaving them there; but as they are very local in their action, to avoid missing a carcinomatous area he uses a combination of the bare tubes in the depth, and the screened radium in the surface in every case of infiltrating carcinoma.

1. *Transurethral method*: Used for growths confined to and situated around the internal urinary meatus, papillomata, pedunculated papillary carcinoma if the pedicle can be reached, and infiltrating sessile growths not more than 2 cm. in diameter.

2. *Suprapubic method*: Used for growths other than the above and without evidence of metastasis, extensive infiltration of the bladder wall, large and multiple tumours, and all doubtful cases.

The technique and the results of the above two methods of treatment are fully described in his paper.

Macdonald,[12] in a paper read before the Urological Section of the British Medical Association, discusses bladder growths and their treatment. Clinically these growths may be divided into: (1) Benign (papillomata), characterized by having long villous processes, and being more or less pedunculated; (2) Malignant (carcinomata), commencing as bald sessile growths, or as an ulcer; (3) Doubtful, being villous in type, but the villi are short, stunted, fleshy, with a relatively broad base; in this group he also includes papillomata occurring in patients over fifty years of age.

Treatment of the first type of growth is best carried out by diathermy, applied through the cystoscope. Suprapubic excision is often followed by recurrence, which may be very rapid and widespread, and usually first appears in the excision scar and in the suprapubic scar in the bladder. Diathermy may eliminate this factor, and, in a patient kept under cystoscopic observation, recurrence can be dealt with while still small, and before the production of symptoms; further, this early destruction of recurrences diminishes the danger of contact growths. Unfortunately, some growths in the region of the internal urinary meatus are mechanically impossible to reach, and in some cases of rapidly growing, widespread papillomatosis, growth takes place faster than destruction. He considers a single papilloma in a patient over forty-five or fifty should be subjected to open operation, owing to the difficulty of deciding by cystoscopy whether such is benign or malignant; he quotes two cases in support of this view.

W. Smith,[13] discussing the radical treatment of cancer of the bladder, considers that total cystectomy should be done much more frequently, and that the disease should be treated as radically as cancer in the breast or stomach. Many patients, now operated upon by attempts at local removal, either should not be operated upon at all, or should have suprapubic cystectomy with thorough treatment of the bladder with radium, or total cystectomy. Four cases are reported.

Egger[14] gives details of 83 cases of bladder tumour; of these, 38 were papillomata, 42 carcinomata, 1 myoma, 1 adenoma, and 1 hypernephroma in the bladder. The prognosis, he says, is always grave, although early and radical removal of a pedunculated tumour, especially if there has been profuse hæmorrhage, is most promising. Total cystectomy was performed in 8 cases, but the patients did not long survive. Of the benign cases, 2 died soon after operation, and 3 later from malignant degeneration.

## VESICAL CALCULUS.

Cranshaw[15] analyses 621 cases examined at the Mayo Clinic between June, 1907, and April, 1921.

Of these, 15 had ureteral-bladder stone, and gave a history of renal colic. On examination, they were found to have a stone of ureteral origin, and without accretion, in the badder; 13 were male and 2 female. The stone was crushed in 5, removed through the cystoscope in 6, passed after cystoscopy in 3, and left alone in 1, with no mortality.

Of 606 cases in which stone had formed entirely or partially in the bladder, 577 were male and 29 female; 4 cases were between one year of age and ten, 13 between eleven and twenty, 34 between twenty-one and thirty, 59 between thirty-one and forty, 71 between forty-one and fifty, 164 between fifty-one and sixty, 183 between sixty-one and seventy, 69 between seventy-one and eighty, 9 between eighty-one and ninety. In 138 males and 15 females litholapaxy was performed (with 2 deaths); in 385 males and 10 females stones were removed by the suprapubic route (with 34 deaths); in 14 males by the perineal route; in 12 males and 3 females through the cystoscope; in 1 female through the urethra with forceps; and in 29 males the stones were not removed.

Of 449 patients radiographed, 345 gave a positive, 91 a negative, and 13 a doubtful result; while out of 459 cystoscopies, 445 were positive, 10 negative, and 4 doubtful. The efficiency of a combined *x*-ray and cystoscopic examination was found to be 98·87 per cent.

Stone occurred in a tuberculous bladder in only one case, and in this there was a urethral stricture; the two conditions rarely co-exist, probably because the severity of the cystitis prevents retention. Urethral obstruction was present in 322 cases: in 277 due to the prostate, and in 45 to urethral stricture. In 33 cases bladder diverticula were found, in 16 of which stone was found in the diverticulum. In 101 cases there was a definite, and in 9, a doubtful, history of renal colic.

In spite of severe cystitis in most of the cases, it is important to note that a history of chills, fever, and sweats was recorded in only 41 cases, and in at least 15 of these there was co-existing pyelonephritis, leaving 25 in which the bladder or urethra might be the focus.

The probable sources or underlying cause of stone formation were: in 266 prostatic obstruction, 38 urethral stricture, 10 atony of the bladder, 3 deformity of the bladder, 3 retention from cystitis, 105 secondary to cystitis without retention, 22 foreign body (including a case in which a piece of flint had been introduced by the patient), 33 bladder diverticulum, 99 kidney, 6 prostatic urethra, 1 congenital, 20 no cause could be made out. Cystitis was given as the cause rather than the result only when there was apparently no other reason for the formation of stone.

In order to avoid the recurrence of stone after operation, due usually to failure to remove the original cause, or to fragments of small stones left behind, *x*-ray and cystoscopic examinations, treatment of renal infections or lithiasis, or cystitis, removal of causes of retention, regular catheterization in atonic cases, removal of diverticula causing cystitis or residual urine, and finally hygienic and dietetic measures to benefit the general health, should be carried out.

In this series 577 cases were operated upon, with 36 deaths. There were 32 recurrences: after litholapaxy 12, after suprapubic cystotomy 18, after perineal cystotomy 1, after removal of the stone through the cystoscope 1.

Rihmer,[16] in an article on operations for urinary stones and their indications, states that the mortality in 88 cases operated on for bladder stones was 6·1 per cent. All the deaths were among the 32 cases subjected to section of the bladder, but in the 56 cases in which litholapaxy was performed the number of recurrences (16) was greater than the number (5) which followed section of the bladder. With a very large or a very hard stone, a stone in a diverticulum, a contracted or sacculated bladder, and in cases complicated by cystitis, pyelitis, or nephritis, he considers that litholapaxy should not be performed; and cases with severe infection should not be operated upon at all, especially if the patient is old. He emphasizes the importance of local anæsthesia for bladder section, and parasacral anæsthesia for litholapaxy. Twelve operations were done for urethral stone; 5 were in the prostatic portion, of which 2 were pushed back into the bladder, one of these being crushed and one being removed by bladder section, the remaining 3 being removed by incision of the urethral bulb.

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## BLOOD DISEASES IN CHILDREN.

*Frederick Langmead, M.D., F.R.C.P.*

In a short survey of the subject, J. H. Thursfield[1] makes a commendable attempt to introduce simplicity where there is much confusion and an ever-increasing complexity in nomenclature. An infinite amount of time and care has been spent in the study of the morphology of blood-cells, but has brought us little nearer a true understanding of blood diseases. Thursfield reduces the anæmias of children to three groups: (1) *Congenital*; (2) *Secondary*—i.e., those in which a removable cause is operating to produce the anæmia; (3) *Primary*—those in which an unknown, and at present unascertainable, cause is operating.

1. *Congenital Anæmias.*—Though there are children who within a few days of birth exhibit a remarkable degree of anæmia, this usually disappears quickly, and he considers it exceptional to meet with a new-born baby suffering from anæmia which calls for treatment. Sepsis is its most common cause, and rarely lues or tuberculosis. Though 'congenital' acholuric jaundice has not been described within the first two years of life, yet the fragility of the blood-cells, apart from the jaundice or anæmia, has been found in some of the youngest members of an affected family. Another instance of congenital anæmia which he cites is that accompanying fatal familial jaundice.

2. *Secondary Anæmias.*—With these he deals very briefly. The group includes the anæmias in which the defect in blood formation is due to general malnutrition or to the action of a poison actively destroying the elements of the blood as rapidly as they are formed. Von Jaksch's anæmia he regards as a primary anæmia, though many hold that an ordinary secondary anæmia may assume this form in an infant. It is a disease almost confined to the hospital class; it is rarely seen before the end of the first year, and almost always ceases by the end of the third; it has characteristic signs: a waxy pallor, enormous spleen, and a high proportion of myelocytes in the circulating blood. It is not fatal in itself, but sometimes is so indirectly by intercurrent infections—bronchopneumonia and diarrhœa. Against its being considered merely a form of secondary anæmia is the objection Thursfield raises that no one has ever seen an ordinary secondary anæmia develop into it.

3. *Primary Anæmias.*—More disputable is Thursfield's division of the primary anæmias of children, or, in other words, of the anæmias whose causation is

unknown, into three groups only—leukæmia, purpura, and 'aplastic' anæmia, which he prefers to call 'the grave anæmia of children'. By leukæmia he understands an anæmia characterized by an enormous increase in one or more of the leucocytic elements of the circulating blood ; by purpura an anæmic disease in which the chief characteristic is the occurrence of extravasations of blood into and beneath the skin and mucous membranes ; whilst the anæmia gravis of children is characterized by progressive diminution of the corpuscles, both red and white, and by the progressive failure of hæmoglobin formation.

Of the two forms of leukæmia, myeloid and lymphocytic, the latter is commonest in children. Though called lymphocytic leukæmia, the cells are not the ordinary lymphocytes of the blood, but cells larger, and with larger nuclei, and nearer in general structure to the myelocyte of the bone-marrow. For this reason many authorities prefer to call this disease myelogenous, and not lymphocytic, anæmia—holding the latter to be excessively rare in childhood. Whatever the nomenclature, if it be agreed, with Thursfield, that the cells are derived from the bone-marrow, then leukæmia must be regarded as a bone-marrow disease, whichever type it conforms to, and the confusing 'mixed' leukæmias are put out of court.

Anæmia gravis (aplastic anæmia) in childhood corresponds, in his experience, to the pernicious anæmia of adults, and is not a specific entity. He believes that if we can discover the focus of infection we may succeed in saving the patients' lives. In this regard Thursfield makes two very debatable contentions—one that severe secondary anæmia of the pernicious form and true Addisonian anæmia are the same disease ; the other, that so-called aplastic anæmia is to all intents and purposes Addisonian anæmia in childhood. While the writer would willingly fall in with his view, it will be disputed by most pathologists, for they regard hæmolysis and the presence of liberated iron in the tissues as essential to true Addisonian anæmia, and this is not demonstrable in many of the clinically similar cases of severe secondary anæmia of pernicious form.

Other fatal profound anæmias belong to the purpura group, almost certainly infective in origin. They can be distinguished from the foregoing types by the absence of glandular, splenic, or hepatic enlargement, and by the tendency of the blood to assume the posthæmorrhagic characters—a moderate polymorphonuclear leucocytosis, a red-blood count higher than 2,500,000 per cmm., and an abundance of nucleated red cells. Infective endocarditis he recognizes as another possible cause of severe anæmia of the 'aplastic' type, but he thinks that in children the diagnosis can seldom be in doubt.

Concerning treatment, he holds that in anæmia gravis our main efforts should be directed to the early detection of the focus of infection. The same he believes is true of the leukæmias, though the evidence for infection is weaker.

Banti's disease he purposely omits, for he has never met with a case in a child before the age of puberty ; but he refers to the rare Gaucher's anæmia, which is known by a family incidence, enormous enlargement of the spleen and liver due to abnormal cells of the endothelial type, and generally a freedom from physical illness, apart from symptoms provoked by the bulk of the organs.

Leukæmias are always fatal, though an improvement may occur temporarily. In the other types of severe anæmia, if we fail to detect the focus of infection, as a rule the disease progresses to death. In the purpuric cases injections of normal **Horse Serum** or of **Human Serum** sometimes appear to stay the tendency to bleed ; but in anæmia gravis, neither serums, drugs, nor in his experience blood transfusions, avail to impede the march of the disorder.

From a study of ten cases, F. A. Evans and W. M. Happ[2] give good reasons for regarding infantile splenic anæmia (von Jaksch's anæmia) as a secondary anæmia, peculiar only in the variability of the infantile response. They summarize their conclusions as follows: (1) In infants with anæmia, enlargement of the spleen is frequent, and enlargement of the liver and lymph nodes fairly common. These findings alone are of no specific diagnostic or prognostic importance. (2) The infantile hæmopoietic system frequently reacts to anæmia by a relative lymphocytosis, by throwing out immature blood-cells, or by both of these qualitative changes in varying grades of severity. Any of these reactions may be present with or without a leucocytosis, and may have no serious significance. (3) The presence, absence, or degree of splenomegaly, hepatomegaly, or general enlargement of the lymph nodes, the severity of the anæmia, the total white blood-cell count, or the type of qualitative changes in the blood, bear no constant relations to each other. (4) The symptom-complex has not been shown to be a disease *sui generis*, and all variations of it are probably merely an infantile response to some agent producing secondary anæmia. It is not entitled to any special name, especially one that suggests a relationship to leukæmia.

[Despite these arguments, there remains the difficulty of explaining the fact that an ordinary secondary anæmia in infants, whether luetic, tuberculous, septic, rachitic, or otherwise, does not give the picture of von Jaksch's anæmia, and has never been seen to merge into it. If a secondary anæmia, it is at any rate an unusual variety of it, and therefore a special name is not amiss, whilst that of 'anæmia pseudoleukæmica' states positively that it is not leukæmia.—F. L.]

In reviewing 23 cases of *leukæmia* which have been admitted to the Mount Sinai Hospital, New York, Murray H. Bass[3] pays special reference to the lesions in the nervous system, which receive scant recognition in text-books. In 4 cases the brain was affected; all were examples of acute leukæmia. In 1, autopsy showed a large hæmorrhage over the surface of the brain; the other 3 ended fatally, with convulsions, delirium, and coma, and in 2 of them lumbar puncture gave evidence of recent hæmorrhage into the cerebrospinal fluid. In some cases the first symptom of the disease is a convulsion. On the other hand, considerable leukæmic infiltration of the brain may occur before causing symptoms, and he recounts a case where large brick-red masses varying in size up to that of a cherry were found scattered through the cerebrum. The girl died in coma, but had shown no cerebral symptoms until a few days before death. Tapie and Cassar comment on the same freedom from symptoms in the presence of leukæmic cerebral infiltration, and report a case of hemiplegia due to capillary hæmorrhage and leukæmic infiltration of the internal capsule. They classify the nervous lesions of leukæmia thus: (1) Medullary degeneration—small foci of sclerosis or capillary hæmorrhage in the brain or cord; (2) Leukæmic infiltration; (3) Hæmorrhages in nerve centres; (4) Nervous lesions due to compression; (5) Herpes zoster.

Bass himself has seen 6 cases of leukæmia in children in which symptoms referable to the nervous system were prominent; 4 of these gave the picture of cerebral hæmorrhage, and 3 were proved. Another case was mistaken for cerebrospinal meningitis, a similarity probably explained by leukæmic infiltration. The last case had terminal cerebral symptoms, and in it areas of leukæmic infiltration were demonstrated after death.

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## BLOOD-VESSELS, SURGERY OF. (*See* VASCULAR SURGERY.)

## BOILS. (*See* FURUNCULOSIS.)

## BONES AND JOINTS, SURGERY OF. *E. W. Hey Groves, M.S., F.R.C.S.*

### SURGICAL TUBERCULOSIS.

Although there is a very general consensus of opinion as to the need of providing school hospitals for children crippled by tuberculosis, yet this need has been met in very different ways in different places. Unfortunately the early promises of the Ministry of Health have had to be temporarily withdrawn, and we still are without any central authority which will compel the adoption of adequate plans by the many hospitals and other agencies which now deal with sick and crippled children.

Telford[1] does great service by describing how much has been done in Manchester simply by the Education Authorities providing residential school accommodation for 114 cripples, of whom from 50 to 60 are cases of tuberculosis. He points out the defect in this plan, which is that it cannot deal with children younger than five, and that therefore, if a child of three to five develops a tuberculous hip or spine, it has to be cared for elsewhere, or be allowed to go untreated until it is of the right age. But even in the unpretentious accommodation provided by two houses in the north of Manchester, excellent results in tuberculous cases have followed hygienic measures associated with conservative surgery. Thus, having investigated the after-results of 159 cases, he concludes that 68 per cent will be cured, 10 per cent will remain uncured, and 22 per cent will die from the disease or its sequelæ. The gravest complication is, of course, septic infection of an abscess, and this accounts for a very large proportion of those who fail to be cured or who die of the disease. The long period for which this treatment is required is rightly emphasized, and the author states that the average time of treatment necessary for cases of tuberculosis of the spine and lower extremity is three and a half years.

Attempts are being made to supplement the unrivalled effects of heliotherapy by some artificial means. Hitherto the most successful of these consists in the rays of the **Mercury Quartz Lamp.** Schönbauer[2] reports results in 1000 cases of bone, joint, and glandular disease in Vienna. He claims that in 42 per cent of superficial bone disease, and 53 per cent of glandular disease, a cure was effected. This form of treatment is especially recommended for the less grave cases of the disease which cannot be sent away to sanatoria. It can be used in an out-patient clinic.

*Pott's Disease.*—Ten years have now elapsed since Albee introduced the method of bone-grafting for tuberculous spine, which he predicted would become the routine treatment for this disease. Unfortunately his sanguine belief that a short cut to recovery had been provided has not been justified by results. Thus a special Committee of Orthopædic Surgeons in America (Brackett, Baer, and Rugh)[3] have examined a large number of cases operated on by grafting and other ankylosing operations. They conclude that such operations have little effect in arresting either the disease or the deformity. In children, after stabilizing operations, the length of treatment by recumbency or mechanical support is not materially shortened; but although a posterior graft may not arrest the disease or the deformity, it will often exert a favourable influence upon the acute symptoms, especially pain.

Baer[4] gives a very careful review of results obtained in 50 cases of **Albee's Operation** for tuberculous spines. His first important conclusion is one which is borne out by all observers, viz., the very great influence of age upon the results obtained by the operation. Thus in children up to six years the result was poor (i.e., the disease was unaffected) in 71 per cent. In cases between six and sixteen the poor results were 66 per cent, whilst in those above sixteen there were only 10 per cent of failures. It is not difficult to understand that an operation which aims at fixing a portion of the skeleton by a new bone strut should be more likely to succeed in those patients where growth had come to an end. The next striking deduction is that the lower the site of the disease, the more favourable is the case for operation. Cervical disease always gives poor results, mid-dorsal cases give good results in 39 per cent, whilst dorso-lumbar and lumbar cases give successful results in 73 per cent. Again, the presence and degree of kyphosis have a most marked influence on the prognosis after operation. With no deformity, success follows in 100 per cent, with slight curvature in 50 per cent, and with marked curvature in only 25 per cent. This is due, first, to the fact that most cases without deformity are adults, and second, to the unsatisfactory condition of trying to shape a graft to a curved spine.

A most significant fact about the relation of fixation operations to cure is afforded by consideration of the duration of the disease before operation is undertaken. Operations within one year of the onset of disease give only 55 per cent good results; in those done after two years this figure is raised to 60 per cent; but if operation is done after more than two years, success follows in no less than 78 per cent of the cases. Natural cure of a tuberculous spine is by ossification at the seat of the disease, and it is stated that this does not begin until three years after onset. Therefore it is easy to understand that a bone-graft will be more likely to succeed if it is done at the same time that nature is ready to effect a cure.

As regards the after-treatment, the author states that children will require mechanical support for just as long with grafting as without. Adults usually require splinting for about six months. The immediate mortality of the operation is not high; but about 8 per cent of the cases die from causes attributable to it.

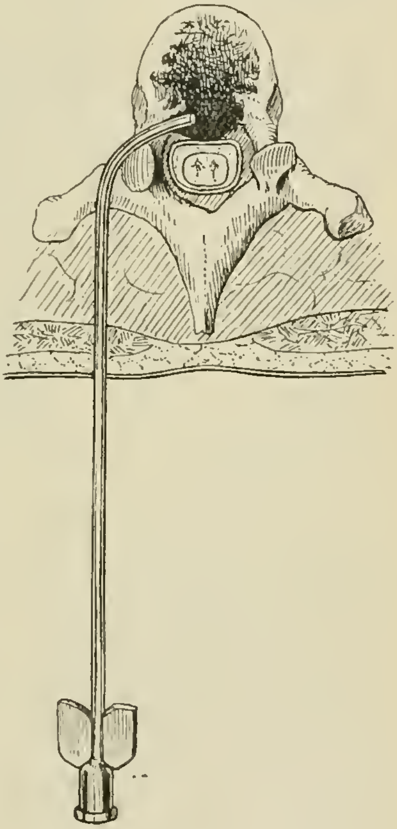

*Fig.* 13.—Calvé's method of evacuating anterior spinal abscesses.

Certain tuberculous abscesses of the spine are notoriously difficult of treatment because of their inaccessibility. Particularly important are those abscesses which lie in front of the spinal canal, between this and the affected vertebral bodies. The pressure caused by such collections often results in paraplegia. Calvé[5] has devised a method by which these anterior abscesses can be evacuated by means of special curved trocars and cannulæ inserted between the articular processes into the intervertebral foramina (*Fig.* 13). He describes three cases in which the method has given successful results, two of these amounting to recovery and one presenting considerable alleviation.

Rost[6] gives an account of a number of cases of tuberculous cavities and sinuses treated by **Oxygen Injection.** The cavity is first aspirated by means of an ordinary aspiration needle and pump. Oxygen is then made to fill the cavity by means of an apparatus which warms and sterilizes the entering gas and is also provided with a safety valve to prevent harmful distention.

In the case of joints and abscess cavities, the cavity may be washed out with iodine solution, before filling with oxygen. The author has treated in this manner cases of tuberculous peritonitis, psoas abscess, and tuberculous knees, ankles, and elbows, and in the cases related the results were uniformly encouraging.

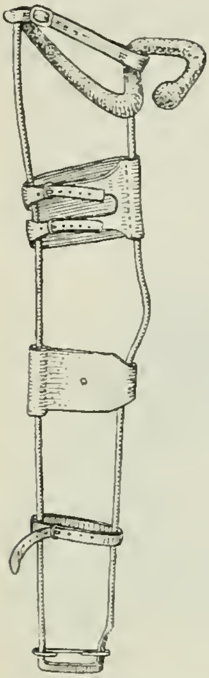

*Fig.* 14.—Bradford abduction splint.

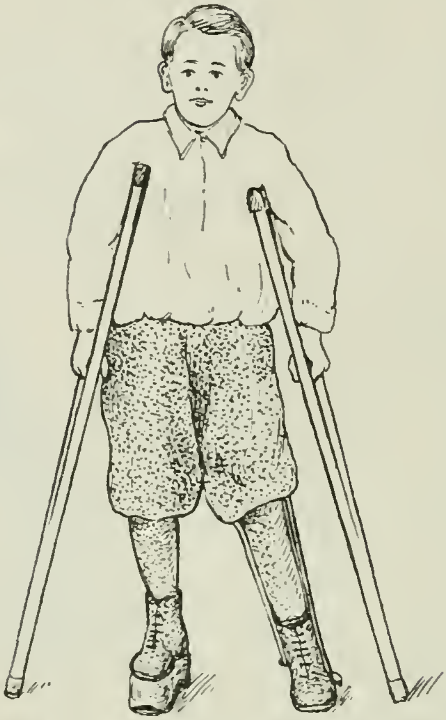

*Fig.* 15.—Case in which the Bradford splint was worn for two years.

*Hip Disease.*—Fish[7] reviews a large number of cases of tuberculous hips in school children, and concludes that there is a serious lack of uniform principle in the treatment of this condition. Too often such cases are merely put up in a succession of plaster spicas, without first correcting the deformity and in spite of the fact that active disease is still in progress, as evidenced by the formation of abscesses. He considers that when good position has been attained, the **Bradford Splint** gives much better results than the mere use of plaster. This splint affords efficient traction and abduction, whilst it leaves the leg so freely exposed that the occurrence of an abscess can be readily detected (*Figs.* 14, 15).

Kappis and Schmidt[8] advocate the use of a method of indirect fixation of the hip in certain cases of tuberculous disease. If the disease has reached a stage when bony ankylosis is the only possible method of natural cure, then this may be hastened and the correct position assured by the use of a bone-graft joining the tip of the great trochanter to the crest of the ilium (*Fig.* 16).

*Tuberculous Ankle-joints in Adults.*—Gaenslen and Schneider[9] have issued a much-needed warning about the very poor results obtained by conservative treatment of tuberculous ankles in adults. After reviewing a large number of recorded cases, the authors describe six cases under their own observation. With the exception of one case, in which the disease was subastragalar, all were treated by arthrodesis or astragalectomy. In three the disease was not cured. Conservative treatment in adults requires four years to cure the disease, and

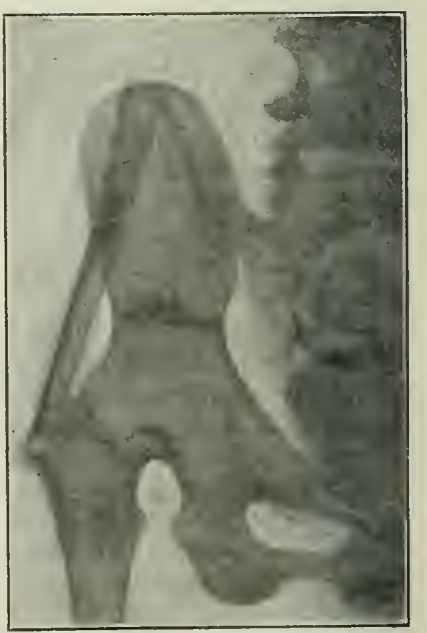

*Fig.* 16.—Indirect fixation of hip in tuberculous disease.
(*After Kappis and Schmidt.*)

then a stiff joint will be the result. A six-months' period of conservative treatment should suffice to determine its efficacy. Fixation of the ankle-joint should be aimed at, and there should be no undue delay in the radical removal of the disease.

## CONGENITAL DISLOCATION OF THE HIP.

Doubt having been thrown upon the lasting good results of bloodless methods of hip reduction, considerable attention has been given to the matter both in this country and in America. In the latter country Goldthwaite and Adams[10] have studied 713 cases. There has been very great diversity in the methods of manipulative reduction and in the position in which the hip is put up afterwards; but one fact stands out clearly, viz., that in children below six years the results are generally good (60 per cent successes), whereas in those over six it is generally bad (27 per cent successes). The anatomical imperfections of the joint do not appear to exercise so much influence upon the after-result as might be expected. This applies particularly to a shallow socket and a poor shelf. On the other hand, torsion of the shaft of the femur does seem to prevent a successful result.

Ridlon,[11] who has had a very large experience and has tried several methods of reduction, urges that skilful manipulation is much more effective than brute force. The generally applied method of Lorenz consists in forcible traction and flexion, full abduction, separation of the adductor muscles by blunt force, and pressing the neck of the femur forward by abducting it over a wooden block. Ridlon now depends on flexion of the thigh to relax tension of the adductors and of the anterior part of the capsule of the joint. The actual reduction is effected by the fingers behind and the thumb in front of the head of the bone forcing it into its socket. In 208 of his own cases, reduction has been permanent in 140 and only temporary in 68 ; but the proportion of lasting successes had been steadily increasing with increased experience. He makes the remarkable statement that there is no reason for assuming that there is any twist in the neck of the femur either to the front or the back. This is quite contrary to usual observations. Thus, for example, Froelich[12] has made very exact measurements, and he states that whereas in the normal bone the neck of the femur points forward 15° as compared with the intercondylar line, in cases of congenital dislocation this angle is often increased to as much as 60°. Obviously this forward distortion of the neck must exercise a very great influence in preventing correct reposition if the leg is kept straight. In cases where this ante-torsion is well marked, the leg should be put up with marked inversion of the knee, and thus kept for three months. The plaster is then cut off above the knee, and the femur is broken against the edge of the cast and replaced with the torsion corrected.

Broca and D'Intignano[13] have given careful study to the changes which take place in the head and neck of the femur and in the acetabulum after reduction of congenital dislocation. Although complete luxation only occurs in about 1 in 10 cases after efficient reduction, yet partial displacement in which the head appears to rest on the margin of the acetabulum is common. Only in 12 cases out of 357 was complete reconstitution of the joint found, and these results were chiefly in cases treated at or before the second year of life. After complete reduction, the head and neck of the femur usually undergo some alteration of the nature of varus, the deformity taking place at the junction of the head and neck. In a certain proportion of cases the head becomes flattened as in coxa plana. Such cases are usually associated with surprisingly good function.

Cases in which reduction has been effected at five or six years very seldom attain anything like a perfect anatomical joint, and the functional results are correspondingly poor.

The problem of old unreduced dislocations of the hip is one which requires further attention. Patients with untreated hip dislocations may, and generally do, acquire considerable functional ability for walking and working. But a time comes, usually between thirty and forty, when compensation breaks down and intolerable pain arises which quickly reduces the patient to crippledom. One method of relieving such patients has been the performance of an osteotomy at or just below the neck of the femur. But the results of this have not been very good. Schanz,[14] however, has modified the method, and made it more precise, in accordance with a very definite theory as to its method of action. He first discusses the typical manner of gait used by these patients. There are two phases (*Figs.* 17, 18) in the act of stepping off with the good leg whilst the dislocated leg remains standing. In the first phase the heel leaves the ground and the knee bends, whilst the pelvis drops towards the sound side (Trendelenburg's sign). This continues until the wall of the pelvis on the affected side comes into contact with the shaft of the femur, when sufficient stability is reached to allow the second phase to take place, namely, the lifting of the toe from the ground and the swinging forward of the sound leg. Schanz argues that the first phase of this limping step can be abolished by an osteotomy of the femur considerably below the small trochanter, followed by such an angulation of the bone as to allow the upper part to lie against the side of the pelvis whilst the lower part is parallel to the sound leg (*Fig.* 19). Not only is the dropping of the pelvis done away with, but also the ugly deformity of the buttocks, and—what is of most importance—the patient is relieved of his pain.

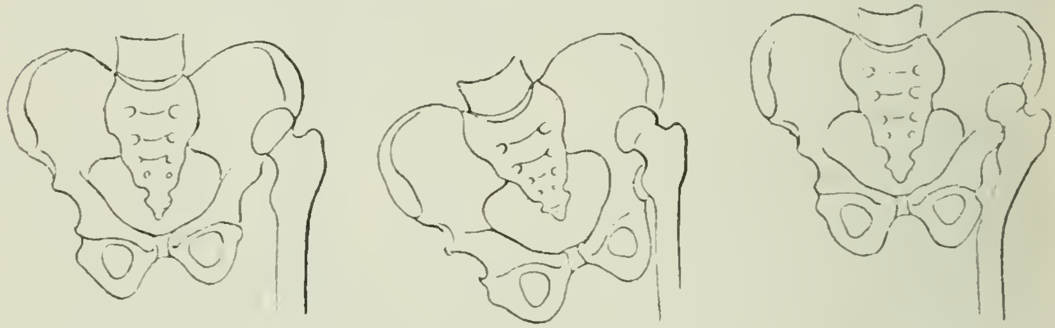

*Fig.* 17. *Fig.* 18. *Fig.* 19.

*Figs.* 17, 18, 19.—Schanz's operation in unreduced congenital dislocation of the hip (*Redrawn from the 'Münchener medizinische Wochenschrift'.*)

## COXA PLANA.

(*Perthes-Calvé-Legg's disease, Osteochondritis Deformans,* or *Pseudo-coxalgia.*)

This condition continues to attract a most disproportionate amount of attention. The trend of opinion is distinctly towards viewing it as a developmental error. It has already been noted that observers working at the subject of congenital dislocation of the hip have observed that many cases after reduction show a flattening and fragmentation of the head of the femur, exactly similar to that seen in coxa plana. Calot and Colleu[15] have come to the conclusion, from a study of a number of cases of coxa plana, that these are all slight degrees of dislocation, or rather of misfitting of the femoral head in the acetabulum.

# PLATE XII.

## PSEUDO-COXALGIA

(HARRY PLATT.)

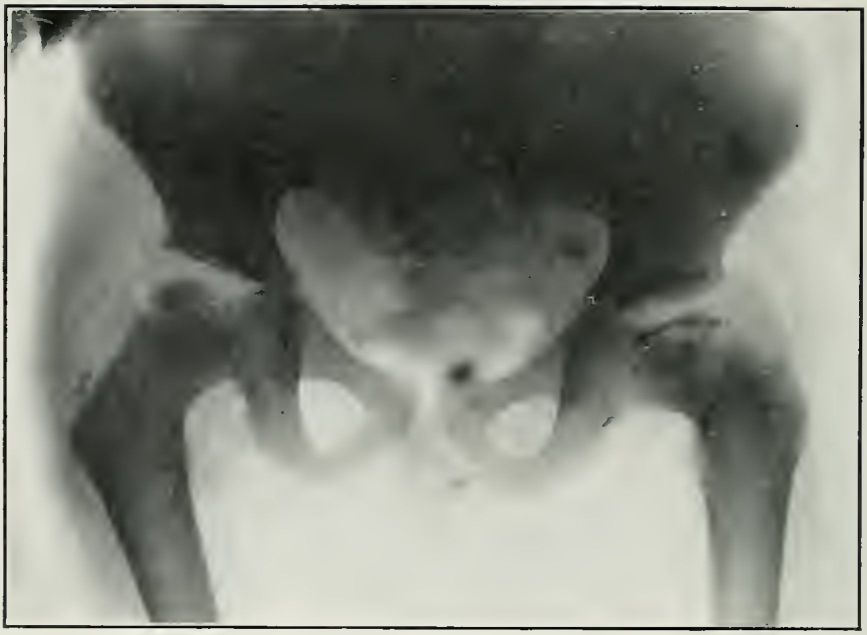

*Fig. A.*—Bilateral pseudo-coxalgia. Period since onset of symptoms: 4 months.

*Right Hip.*—Head shows extreme flattening, and is reduced to an attenuated strip; hypercalcification but no actual fragmentation. Neck shows broadening and rounding off, with spongy internal texture.

*Left Hip.*—Head shows fragmentation; dissolution of the inner half of the bony nucleus. Neck is shortened, but shows no other striking features. The acetabular roof presents a curious crenated appearance.

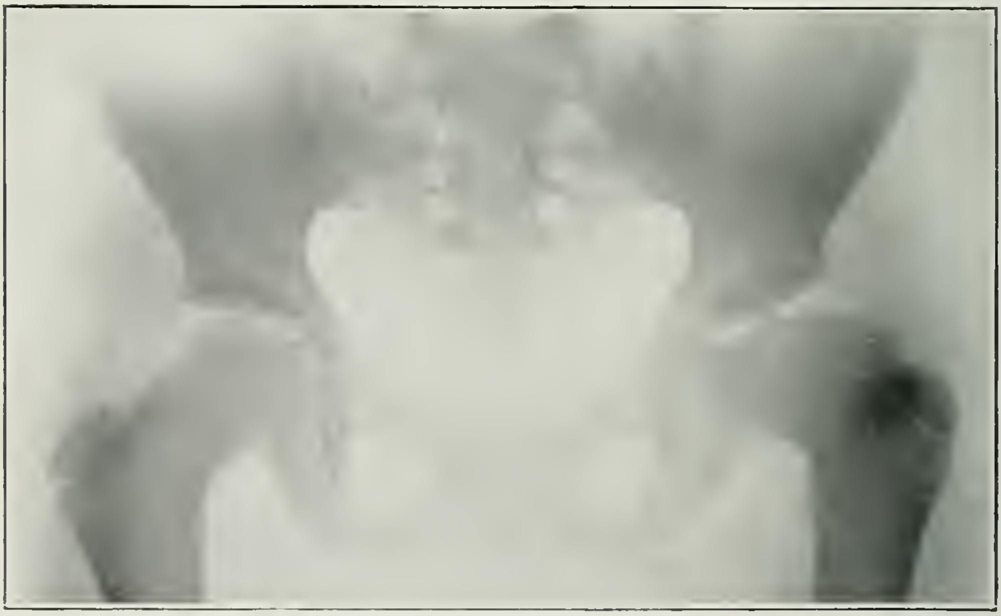

*Fig. B.*—Same case as *Fig. A*, 4 years later.

*Right Hip.*—Reconstructed head, with uniform opacity: expansion well marked, one-third of the head being outside the acetabulum, which shows a sloping roof.

*Left Hip.*—Femoral head is practically restored to the normal.

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Platt[16] has reviewed the whole subject with a great wealth of detail and illustrations which will make his paper a standard of reference for some time to come. He shows the changes through which the head and neck of the femur and the acetabulum pass in the evolution of the disease (*Plate XII*). At first there is merely flattening and fragmentation of the nucleus of the head of the femur. Then the neck of the bone becomes broader and is set more at a right angle to the shaft than is normal. Finally, the picture is of an expanded femoral head fitting badly into an acetabulum too small for it. These changes occupy three to six years in their progress, but it is usually only in the early stages that any pain or muscle spasm is present. Treatment by prolonged immobilization does not produce any effect on the progress of the bony changes. Unfortunately Platt commits himself to the theory of the bacterial origin of the disease on very insufficient data.

## ARTHROPLASTY.

The mobilization of ankylosed joints by means of an open operation is no new proposal. It was first brought into prominence by Murphy, of Chicago, whose description of the method of operative mobilization of the hip and the knee still remains a classic; but it has been a matter of general experience that the results of the operations he devised have fallen far short of the expectation he raised. Hips have become stiff and painful, whilst knees have not retained sufficient rigidity. The matter, however, has forced itself upon us again owing to the large number of cases of ankylosed joints resulting from the war. It is to the orthopædists of North Italy that we are indebted largely for the persevering attempts to win success out of failure in this endeavour, although the subject has also been worked at in Germany, America, and this country. Putti[17] now reports his experience and results in no less than 113 cases, made up as follows: 10 maxillary, 1 shoulder, 38 elbows, 1 thumb, 2 fingers, 17 hips, 40 knees, 2 ankles, 2 great toes. These figures in themselves are rather arresting, particularly in relation to the small number of cases of the shoulder, thumb, and fingers, and the large number of knees. It is a matter of common observation that the small joints of the digits, with the exception of that of the great toe, are the most difficult of all the articulations to restore to functional movement. The shoulder is so well dealt with by fixation of the scapulo-humeral joint and compensatory mobility of the scapula that it too is seldom the subject of arthroplasty.

According to Putti, the absolute indications for arthroplasty are: ankylosis of the jaw, fixation of the elbow in extension, double ankylosis, and ankylosis of several joints in the same limb. In all other conditions much judgement is required in the selection of cases for operation, and the following represents the author's experience in this choice. The most favourable age is between twenty and fifty. It is clear that old patients are unlikely to respond well to reconstructive procedure, and in the young the articular ends of the bones are not sufficiently set in their growth to give enough rigidity to the new joint. It is extremely important that the patient should be both intelligent and keen, because his co-operation in moving the joint is almost essential. Prolonged after-treatment, with graduated exercises and a judicious combination of splinting and movement, is very desirable, and it is useless to do these operations in city hospitals and then, after a month, allow the patient to return home away from supervision. In regard to the type of ankylosis which is more favourable for repair, that due to injury is more likely to succeed than that due to infection. Complete bony ankylosis gives better results than painful fibrous ankylosis. A joint which has become fixed as the result of an acute primary infection is likely to give a better result than one which has been merely an incident in a polyarticular infection. It is advised that at least one year should elapse between the period at which pain disappears and the performance of the arthroplasty. Tuberculous joints are unsuited for the operation, because of the dangers of lighting up the latent disease.

The technique of the operation requires special attention to the following points: Bone must be freely removed from both articular ends, so that at least 2 cm. space is secured. Each end is then shaped with great care and precision, so as to secure a mechanically efficient articulation. All scar tissue must be removed, not only from the joint space but from the periarticular tendons and ligaments. A free flap of fascia lata is then attached round each shaped articular end (*Fig.* 20). It is quite unnecessary to shape pedicled flaps, as these are much more difficult to secure of adequate size and thickness. Putti regards the fascial covering of the bones as essential in order to secure easy gliding of the new joint surfaces upon one another, to prevent synostosis, and to create a new synovial cavity.

After the operation the joint is placed in the semi-flexed position, with weight traction applied to the distal part, and this is kept in action for one month. From the tenth day movement is begun, and this is at first passive movement carried out by the patient himself by the aid of pulley and cord. Later, active movement is encouraged. It has been noted that in almost every case, about one month after the operation, a critical phase occurs in the recovery. This is marked by the occurrence of pain and heat. At this stage movement should be discontinued, and should only be resumed very gradually. There were 2 deaths in the 113 cases.

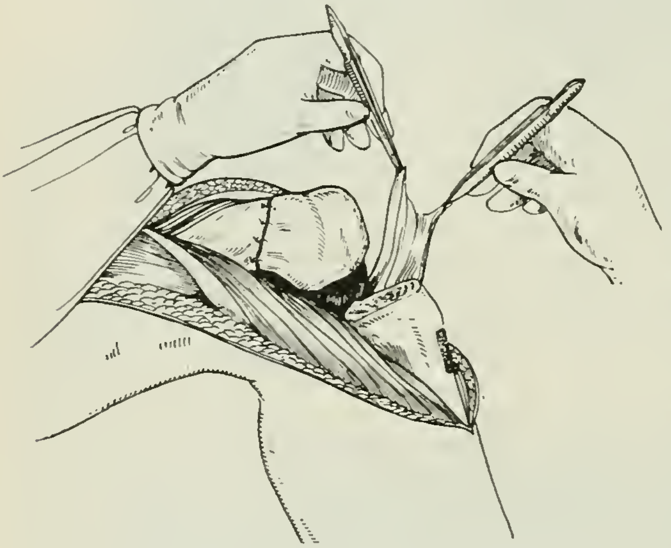


*Fig.* 20.—Arthroplasty of the knee, by Putti's method.

Success attends the operation in greater degree with some joints than with others. These, arranged in order of frequency, are the elbow, knee, jaw, hip. It is stated that in many cases the joint is quite as useful as before the occurrence of ankylosis, and that mobility, stability, and freedom from pain may be secured even in such a joint as the knee, which, contrary to English opinion, is considered one of the most suitable joints for this operation. (*Figs.* 20, 21, 22.)

Hohlbaum,[18] reporting from Payr's clinic, is in remarkable agreement with the above-mentioned opinion of Putti. Payr refuses to operate upon any pensioner or any person about whose keenness to get better there is any doubt. A description is given of arthroplasty in 85 cases of ankylosed knees. Of these, 35 were due to inflammatory causes, and gave 10 very good and 13 good results; 50 were of traumatic origin, and these gave 15 very good and 10 good results. This represents 56 per cent of the total number who were materially benefited by the operation. By the description of 'very good' is implied that the knee can be flexed at least to 100°, that there is full voluntary extension, and that there is complete stability in standing and walking without the use of any apparatus. Of the failures, only 2 are admitted to have had marked lateral mobility. Post-gonorrhœal cases gave the best results, and post-pyæmic the worst. Payr does not exclude tuberculous cases provided the patient is young and the disease has been a long time cured. In addition to the details mentioned by Putti, this author lays stress on the reconstruction of the extensor apparatus by tendon- or fascia-grafting and the formation of new lateral ligaments. He makes the same observation as Putti about the occurrence of a critical phase of healing, which he places at the fifth or sixth week after the operation. It is marked by an inflammatory reaction, and corresponds with the outpouring of the new synovial fluid.

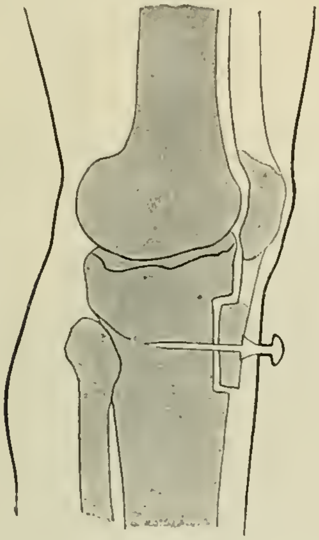


*Fig.* 21.—Method of refixing the tubercle of the tibia after arthroplasty of knee.

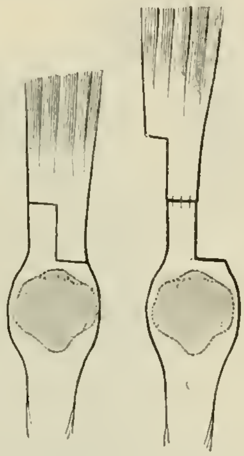


*Fig.* 22.—Method of lengthening the quadriceps tendon.

The number of mobilized hips was 20, and of these only 2 were traumatic; 6 gave very good and 5 good results. If the hip-joint has been quite obliterated, then, instead of attempting to re-form the original joint, a new articulation ('saddle-shaped') is made in the neck of the femur, and a pedicled flap from the tensor fasciæ femoris interposed between the new-formed bone surfaces. In 5 cases ankylosis of the ankle was mobilized by arthroplasty, and all these were successful. The foot is dislocated backwards after cutting across all the dorsal extensor tendons. The astragalus is made smaller and the tibio-fibular socket is enlarged by the chisel. Free fascia is then interposed in the joint cavity. The divided tendons are sutured. The remark is made that it is far easier to mobilize an ankylosed ankle than it is to fix a flail ankle.

Wheeler[19] describes one case of arthroplasty on both knees which gave a brilliantly successful result. The patient was a girl of 11 who had had osteomyelitis of both tibiæ, followed by bony ankylosis of the knees. The left was fixed in flexion, and the right in extension. The left knee was operated upon first. An incision was made in each side of the joint, and a pedicled fat-fascia flap formed on both sides. The femur was formed convex and the tibia concave from before backwards, and the two flaps were sewn over the upper surface of the tibia. The slack quadriceps was tightened by turning the patella over so that its superficial surface faced the joint. The leg was put up on a simple back splint, and, after the wound had healed, voluntary movements were encouraged. Six months later a similar operation was done on the right knee, except that the patella could not be 'turned turtle', and a special fascial flap was interposed between it and the femur. Perfect recovery took place, although a certain amount of lateral mobility remained (*Plate XIII*). Wheeler attaches great importance to a deliberate removal of the remains of the original capsule and lateral ligaments of the joint, because this prevents contraction and stiffening, and also because it ensures a painless convalescence and permits early voluntary movement.

*Fig.* 23.—End-result of arthroplasty in a case of ankylosis : showing voluntary flexion.

*Fig.* 24.—The same case as *Fig.* 23 : showing voluntary extension.

Campbell[20] reports one successful case of knee arthroplasty done for a case of bony ankylosis of four years' standing, but the age of the patient and the nature of the original disease are not mentioned. The patella was turned up by a U-shaped incision dividing the ligamentum patellæ. As little bone as possible was removed, and the articular ends were shaped by a chisel and curette as nearly as possible to resemble the normal joint. The lateral ligaments were carefully preserved, but their attachment to the femur was separated as high as necessary to allow flexion of the joint. A large pedicled flap of fascia lata was turned down from the outer side of the thigh and stitched to the external and internal ligaments so as to lie across the joint. The patellar ligament was sutured with catgut.

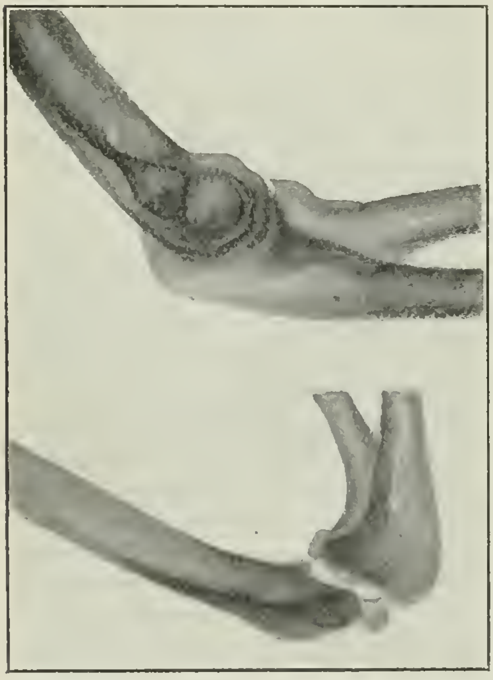


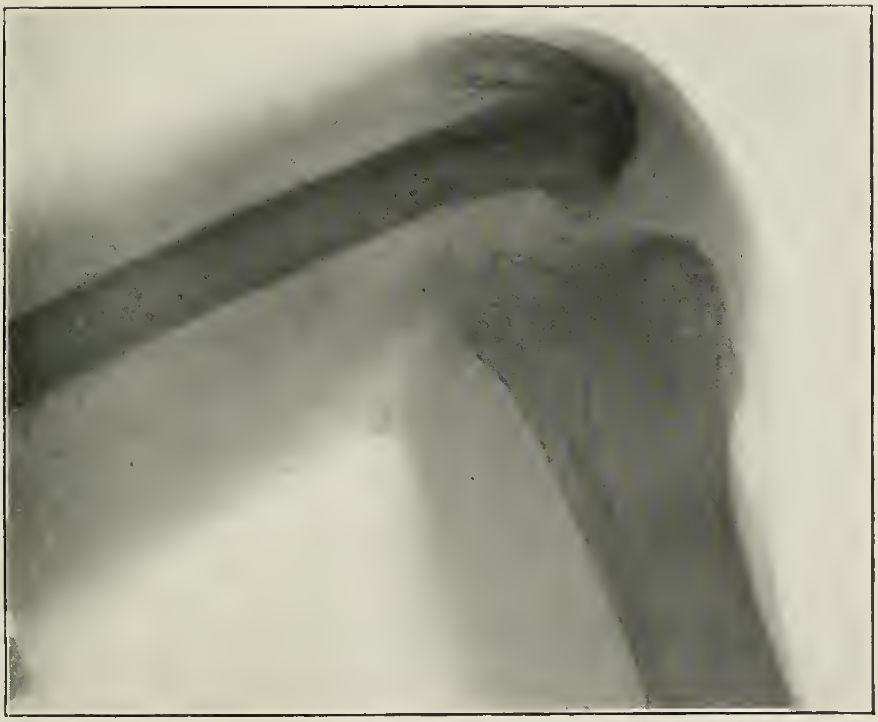
*Fig.* 25.—A case of ankylosis before and after arthroplasty. (*Figs.* 23–25 *redrawn from 'Surgery, Gynecology, and Obstetrics'*.)

MacAusland[21] gives a useful summary of experimental and clinical articles on arthroplasty, as a result of experience in the laboratory and clinic. Practically all surgeons now use either free fascia transplantation or pedicled fatty fascia for covering the bone ends. It must be admitted, however, that experimental work, although showing that free fascia flaps are as good as pedicled flaps, yet does not show much, if any, superiority of arthroplasty over mere

# *PLATE XIII.*

## RECONSTRUCTION OF ANKYLOSED KNEE-JOINTS

(Sir W. I. de C. Wheeler.)



Showing amount of voluntary flexion in right knee-joint 18 months after operation.

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excisions. MacAusland describes 31 personal cases of arthroplasty of the elbow-joint. The joint is exposed by a U-shaped flap. In some cases a fascial flap is formed *in situ*, but a free flap of fascia lata is taken in all. This is wrapped round the end of the humerus after the latter has been shaped, but no special covering is provided for the ulna or radius. The arm is put up in plaster for one week, and then hot air and passive movements are employed. In 26 cases late reports were available, and of these, 19 showed complete success, 4 partial success, and 3 were failures (*Figs.* 23, 24, 25).

## FRACTURES.

It is said that about two hundred different methods of treating the fractured clavicle have been described, and new modifications are still suggested.

Soler Julia[22] speaks well of the use of a light plaster jacket. It is particularly useful for those cases where reposition of the fracture is easy but maintenance in good position is difficult. Full reduction of the fracture is made by raising the arm and pulling back the shoulder, and a plaster jacket is then applied which covers the whole chest and the affected collar bone, but leaves both arms free. It is the unrestricted movement in the shoulder-joint whilst the clavicle is held by the plaster which constitutes the novel and attractive feature of this proposal. Hartel[23] lays emphasis on the necessity for backward traction on the shoulder in order to obtain correct alinement for the fractured clavicle. The figure-of-8 bandage pulling back the shoulders is an old device ; but Hartel suggests that it is also advisable to keep the arms back by a staff passed behind the elbows.

Schlesinger[24] gives a very useful account of 458 consecutive out-patient fractures in regard to treatment and prognosis. Seventy-seven of these were fractures of the clavicle. He divides them into two categories : those of the outer portion due to direct violence and requiring chiefly support of the weight of the elbow, and those of the middle of the bone caused by indirect violence pushing the shoulder back and breaking the clavicle over the first rib. In these, the common type, the essential of treatment is to keep the shoulder pulled well back. There were no bad results, and the average time of treatment was three weeks. Only 70 cases of fractured humerus were treated as out-patients, many others, including most oblique fractures and fractures of the musculospiral groove and fractures towards the end of the bone, being admitted for operation. Fractures of the surgical neck and great tuberosity were mostly treated on a Stromeyer's cushion. and in only 9 out of 20 were the results good. The advisability of using an abduction arm splint is not mentioned. As the majority of fractures of the shaft are sent for operation, it is not surprising to learn that those treated by splinting and massage gave very good results, as these were cases where displacement was very slight. In fractures of the lower end of the humerus (37 cases), all except one were put up in full flexion, followed by movements and massage in three weeks. One case with anterior displacement of the lower fragment was put up in full extension and supination. In 16 cases of fracture of the head and neck of the radius, treatment was by full flexion of the elbow and supination of the hand, and 9 gave excellent results. Fractures of the mid-shaft of the radius not operated upon were put up in full supination on an anterior angular splint.

There were 73 cases of Colles's fracture, and 20 cases of separation of the lower epiphysis. All were treated under anæsthesia by forcible manipulation over a block, and put up on a splint with palmar flexion to a right angle. After forty-eight hours they were placed on an anterior or cock-up splint. Massage and whirlpool baths were then used daily, and in the average case cure took place within five weeks. In about 10 per cent the functional results were bad, and in another 10 only moderate. Cases of fracture of the shaft of the ulna (18) and of both forearm bones (34) were treated by flexion of the elbow and full supination. Fixation was usually by plaster-of-Paris strengthened by a metal bar. All the ulnar cases and 29 of the two-bone fractures gave perfect results. In fractures of the carpal scaphoid it is said that treatment should be by excision. In fractures of the metacarpals and phalanges the treatment is by bandaging over a tennis ball, which preserves both the longitudinal and transverse arches of the hand. In exceptional cases of phalangeal fracture, reduction may be made by a silkworm-gut suture passed through a hole drilled in the finger nail.

*Wrist.*—Fractures at the lower end of the radius are the subject of critical inquiries by Klapp[25] and his assistant, Bange. In regard to recent fractures there are certain disadvantages in putting up the hand in either dorsal or volar flexion. Dorsiflexion is very liable to cause backward displacement of the distal fragment even after full reduction. Volar flexion, which on the Continent has long been associated with Schede's name, is a good method of retaining the fragments in position, but very liable to be followed by stiffness of the wrist with great loss of flexor power. The conclusion, therefore, is that the hand should be put up in a mid-position both as regards flexion and also rotation. [This is, of course, the position assumed by the use of Carr's splint, which does not appear to be known on the Continent.—E. W. H. G.] It is essential that the deformity should be fully reduced at the earliest possible moment. Klapp recommends the use of a metal stand on which the arm is held, and over which the angulated bone is rectified. When reduction has been complete, the hand and forearm are put up in plaster, the thumb and fingers being left free for flexion. The plaster is removed after three weeks. Old unreduced cases should be treated by osteotomy.

No less than 2800 cases of this injury of the lower end of the radius are reviewed and classified according to the method of treatment, in order to compare the results obtained. The proportion of women to men was as 6 to 5. The greatest number occurring in any decennium was between 50 and 60. Bad results occurred in from 3 to 13 per cent according to the method of treatment. Plaster-of-Paris in dorsiflexion gave 11 per cent of failures, the 'no splint' method 9 per cent, Schede's volar flexion 6 per cent, and Klapp's method only 3 per cent. Really bad results were generally associated with complete reduction and long immobilization. The most rapid functional recovery occupied about 24 days, and was obtained by the 'no splint' method as well as by Klapp's. The longest period before functional recovery was 260 days, and occurred in a case which had been fixed in a splint for one month.

Bizarro[26] gives an account of the details of bony lesions sustained in 128 cases of injury to the wrist. It is a matter of very great importance to distinguish these fractures from the more indefinite type of sprains. In no less than 60 cases (55 per cent) of these 128 there was a fracture of the scaphoid bone. The fracture was incomplete in 13 cases, complete in 30 cases, and associated with some other fracture with synostosis in 13. In a very large proportion of the complete fractures non-union remains permanently. Of the other single carpal bones fractured in these series, we have the semilunar 2 cases, the os magnum 6, and the unciform 4. A great number and variety of fractures affecting two bones simultaneously were observed, the commonest two-bone fractures being the scaphoid and semilunar, and then the scaphoid and radius. The treatment of these cases is very difficult in respect of ensuring good and painless functional recovery. In general terms the upper carpal lesions require rest in the early stages, whilst the lower carpal lesions should

# PLATE XIV.

## FRACTURE OF THE WRIST, WITH FUSION OF BONES

(BIZARRO)

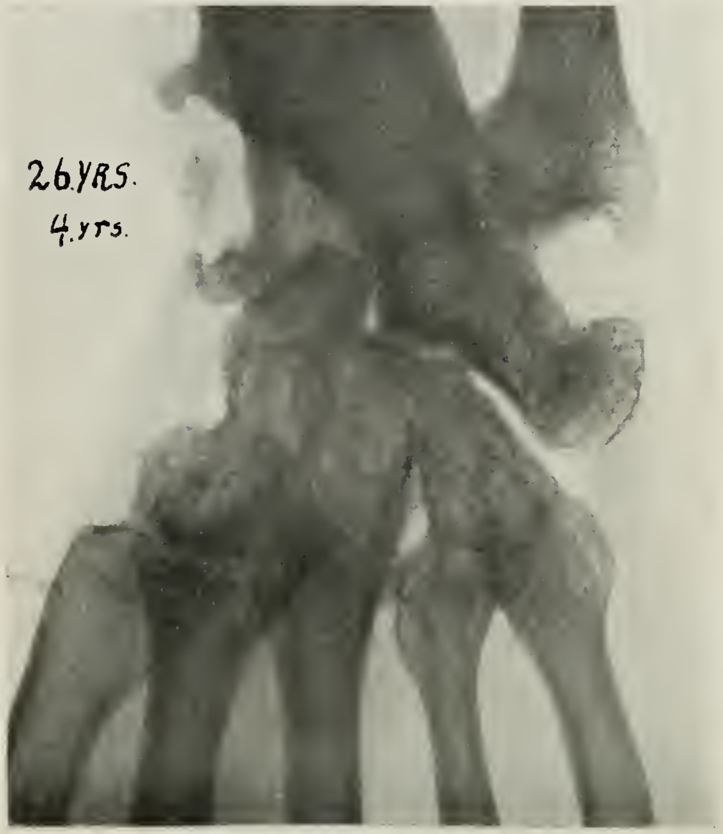


*Fig. A.*—A case of carpal traumatic fusion

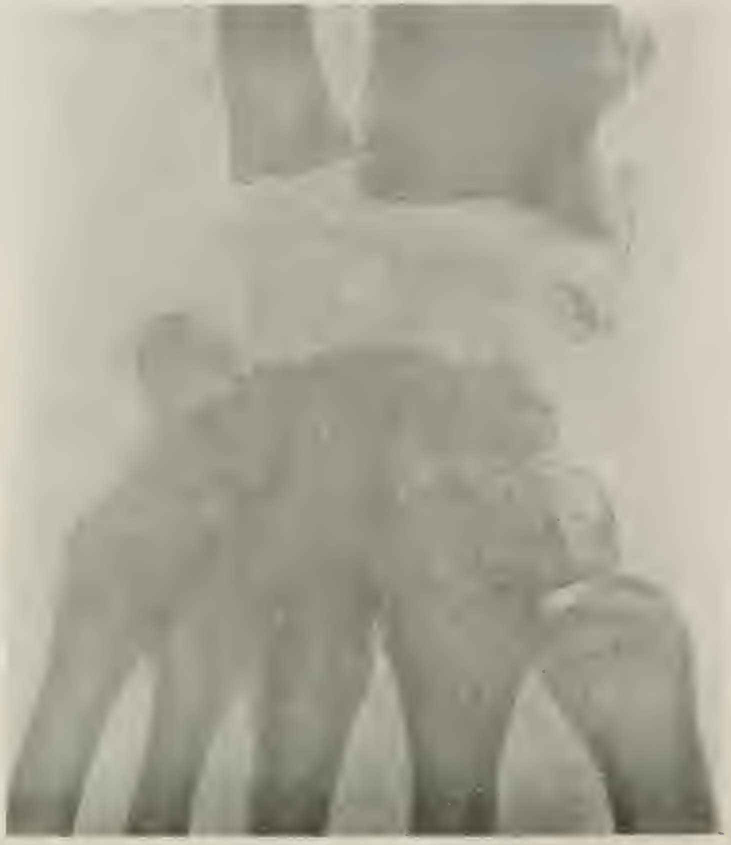


*Fig. B.*—The same case as *Fig. A*, one month after the operation of 'mobilization.' The hand is in an extension splint.

*By kind permission of 'Surgery, Gynecology, and Obstetrics'*

# *PLATE XV.*

## FRACTURES OF THE CARPAL SCAPHOID

(ALAN TODD.)

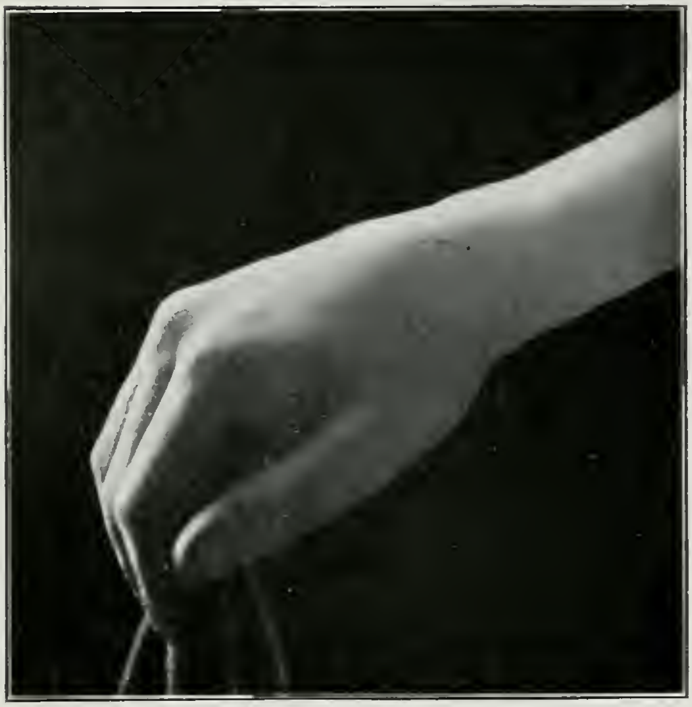


*Fig. A.*—The typical œdema of a case of fractured scaphoid.

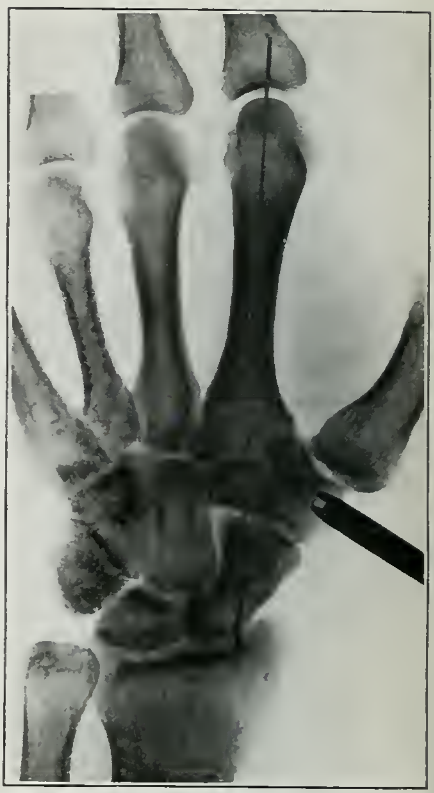
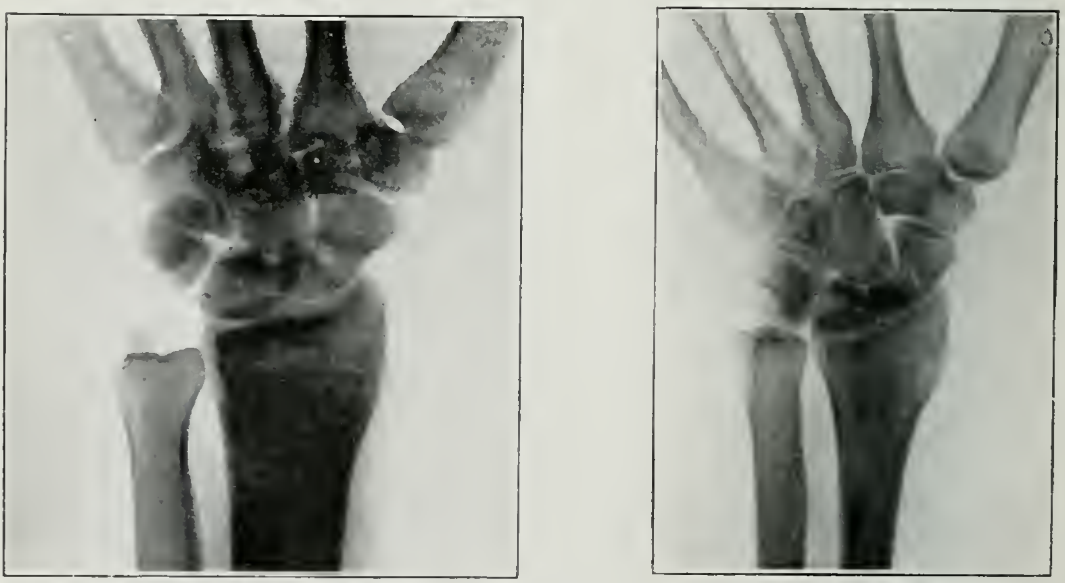


*Fig. B.*—Showing the transmission directly to the scaphoid of the force of a blow applied to head of second metacarpal.



*Figs. C, D.*—Transverse or 'snapped-waist' fracture of scaphoid, produced in abducted position of carpus, as always.

*By kind permission of 'The British Journal of Surgery* be mobilized from the outset. Fragments which cannot be reduced into good position should be removed as early as possible. In those cases where fusion of the carpal bones with the radius and ulna has occurred, a wide resection should be done, the ends of the cut bones being covered in by fascia lata (*Plate XIV*).

Todd[27] gives a very careful and fully illustrated account of the fracture of the carpal scaphoid. It is an injury of some importance because, whilst it is easily overlooked, it may lead to very prolonged pain and disability. Such fractures are indeed very rarely seen at a recent period after injury. It is only after months or years of pain and disability that on special *x*-ray examination the lesion is discovered. The accident usually consists in a fall on the hyper-extended wrist, sometimes it is a 'back fire', the violence used being considerable. The early signs of the injury consist in œdematous swelling over the 'anatomical snuff-box', the contour and folds of the wrist itself not being altered (*Plate XV, A*). There is acute tenderness on pressure over the same area, i.e., distal to the radial styloid. Another more indirect sign is obtained by making the patient close his fist and then tapping on the knuckles, one by one. Sharp pain will be elicited by percussion of the head of the second metacarpal, but not of the other bones (*Plate XV, B*). Pain is also elicited by any attempt to hyperextend the wrist. The final act of diagnosis will, of course, lie with radiology (*Plate XV, C, D*); but it should be borne in mind that these fractures are easily overlooked even by the *x* rays, and several plates in different planes should be taken of all doubtful cases.

All writers are agreed that non-union is the common result of scaphoid fracture. There also seems little doubt that this non-union is in some way related to the persistent pain and weakness. The best way to secure union is by employing fixation on a 'cock-up' splint for three weeks, following this by the usual physiotherapy for three months. If, at the end of this time, pain and weakness are associated with a non-union, it is better to excise the scaphoid without further delay. If operation is delayed unduly, a certain degree of arthritis and peri-arthritis is likely to have become established in the carpus, and this will not be cured by removal of the offending bone.

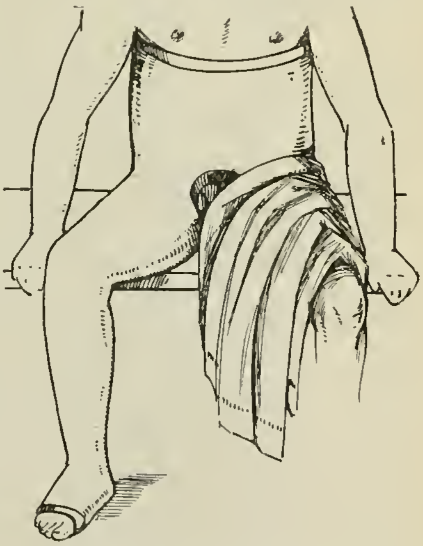


*Fig.* 26.—Patient sitting on bench immediately after cast has hardened. This patient was not anæsthetized. (*Redrawn from the 'Boston Medical and Surgical Journal'.*)

*Femur.*—Moore[28] contributes a very valuable and practical suggestion for the treatment of fractures of the neck of the femur. The method was tried first in the case of an old man of 78 with an extracapsular fracture, who was nervous and also suffered from incontinence. The fracture was reduced under an anæsthetic, and the leg was then put up with right-angled flexion of both hip and knee in a plaster cast. The next day he was placed in a wheel-chair, and he spent every day of an uneventful convalescence in this way. The advantages of the flexed hip over the extended position advocated by Whitman are obvious, because the patient can sit up and be moved about from the very first (*Fig.* 26). The author gives a list of 42 cases treated by this method, the average age of the patients being 65 years. Of these, 25 (60 per cent) gave a good result.

*Os Calcis.*—This injury is fairly common in young and middle-aged men, and it is important because it produces a severe and lasting late disability. Cotton[29] discusses the treatment of this late result, which he regards as being chiefly due to excessive new bone formation on the outer side locking the fibula to the os calcis. The treatment he suggests consists in an external U-shaped incision, the turning up of a periosteal flap, with wide removal of the new bone formation (*Fig.* 27).

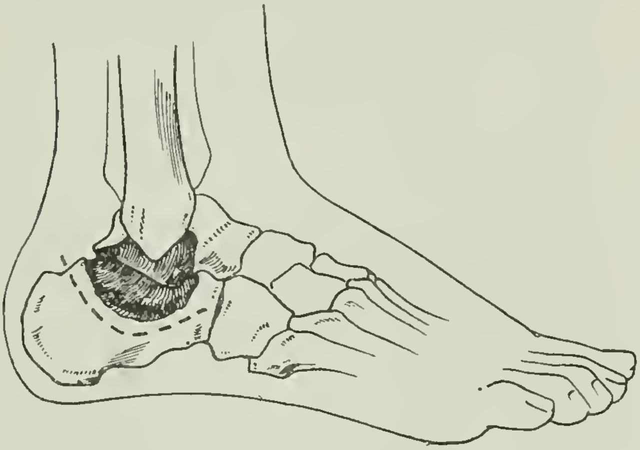


*Fig.* 27.—Cotton's operation for removal of superfluous bone after fracture of os calcis. Dotted line = osteoperiosteal flaps; shaded area = bone excised. (*Redrawn from the 'Annals of Surgery'.*)

*Non-union of Fractures.*—Although it is generally agreed that the majority of ununited fractures should be treated by bone-grafting, yet the most favourable accounts of this procedure admit that failure occurs in at least 20 to 30 per cent. Waring and Milligan[30] recommend that the majority of ununited fractures should be treated by comminution and impaction, a procedure which they maintain is much more certain of giving a successful result than any other method. Whether we agree with this conclusion or not, there can be no doubt that the methods proposed by these authors are very valuable in dealing with cases where bone-grafting has already been done unsuccessfully. The operation is undertaken in two stages. In the first stage the ends of the bone are exposed, refreshed, and all possible scar tissue is removed. In the second stage, which is only performed when healing without suppuration has taken place, the ends of the bone are again exposed, and divided in such a way as to produce some comminution, the separate pieces of bone having their connection with the soft parts and periosteum carefully preserved. The bones thus comminuted are forced together so as to produce some degree of impaction, and the limb is then put up in such a way as to maintain this apposition. If the affected bone exhibits a gap the patency of which is preserved by a parallel bone, then this latter is divided in an oblique manner, or a piece removed from its continuity, so as to permit the impaction of the ununited fracture (*Plates XVI, XVII*).

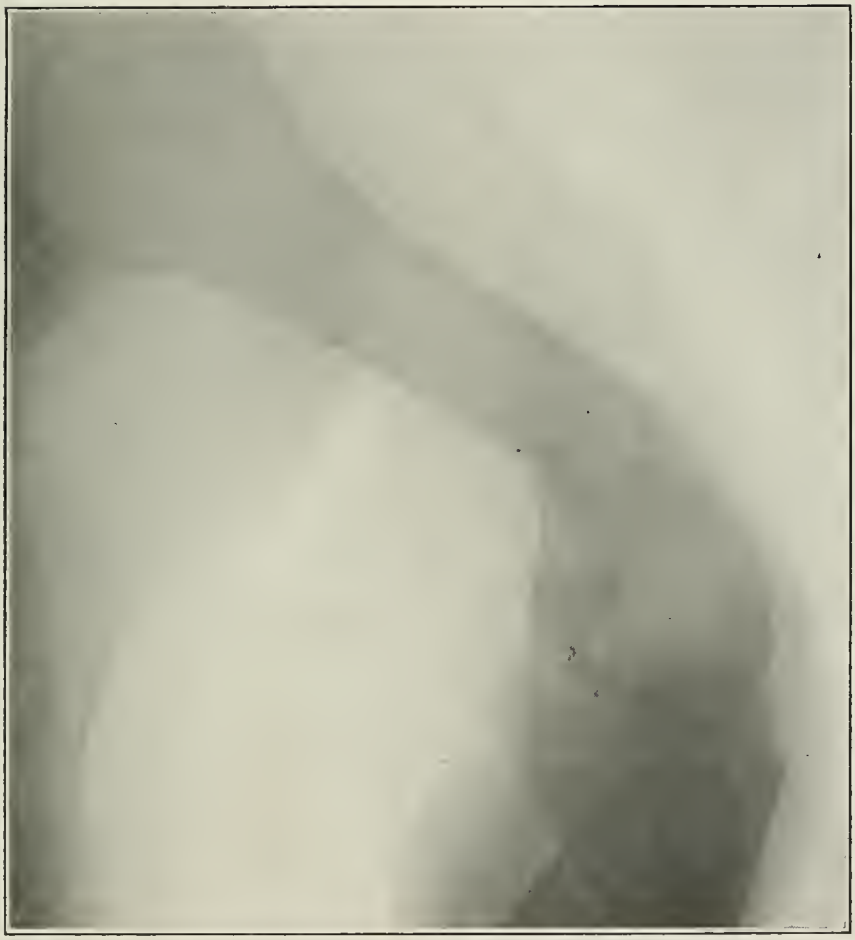
## BONE-GRAFTING.

In the modern tendency to utilize living autogenous grafts for the repair of bone defects it is as well that we should be reminded of the great value of dead bone-grafts. This is a fact which has been known for a very long time, but its practical importance is lost sight of. Gluck[31] has done very remarkable work with dead bone transplantation, and he now has a record of no less than 220 cases in which ivory or boiled bone has been used to replace portions of the long bones. The majority of his cases are those in which the original cause of bone loss was osteomyelitis in children, and it is quite obvious that the well-known power of bone regeneration in such cases is an almost essential factor. For such cases he has reconstructed the radius, the ulna, and the tibia from rods of ivory. In one case a man, who is now thirty-two, had his tibia replaced by an ivory graft at the age of five. He is now leading an

# *PLATE XVI.*

## NON-UNION OF FRACTURES

(Waring and Milligan.)



Simple transverse fracture of left humerus at junction of middle and lower third. Radiograph after comminution and impaction shows firm union. The posterior angulation deformity still persists, but functional alinement is good.

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# *PLATE XVII.*

NON-UNION OF FRACTURES—*continued.*

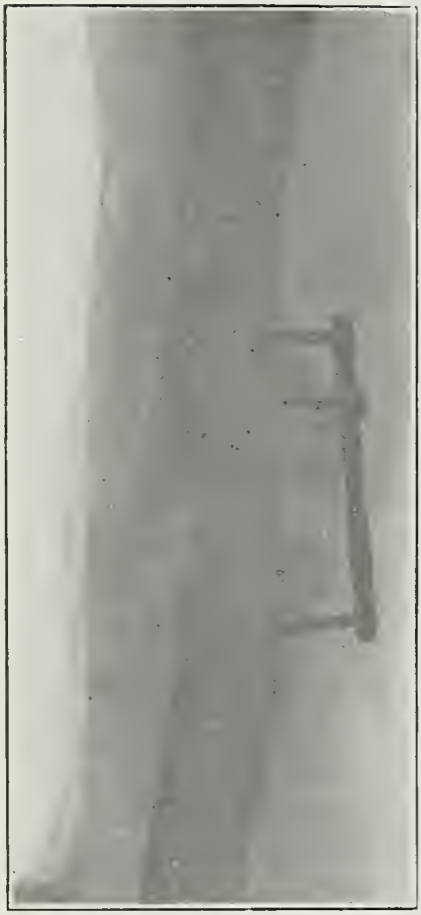

*Fig. A.*—Simple fracture of middle of shaft of right humerus. Radiograph of fracture before final operation, with loose plate still *in situ.*

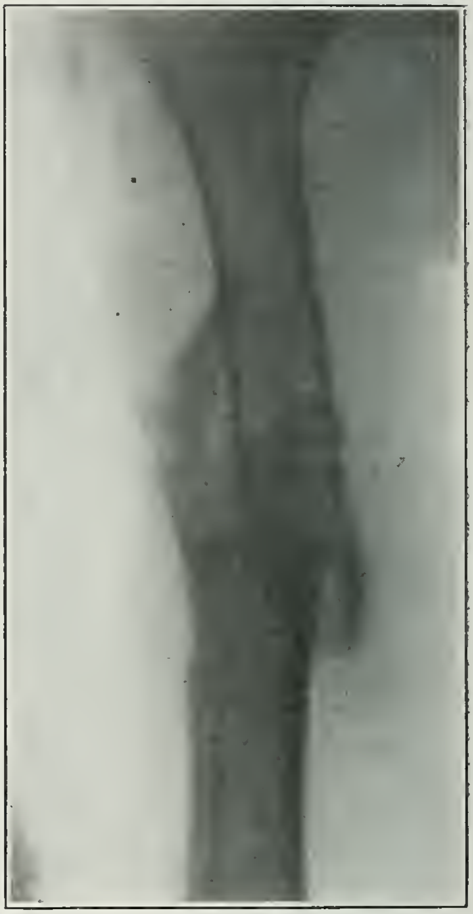

*Fig. B.*—The same case as *Fig. A*, long after union had occurred, showing abundant firm callus.

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# PLATE XVIII.

## BONE-GRAFTING IN UNUNITED GAP FRACTURES (FORRESTER-BROWN.)

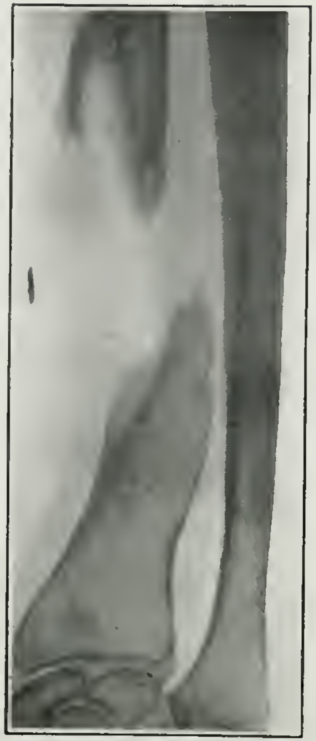

*Fig. A.*—Ununited radius with much radial deviation of hand. Before operation (two-stage).

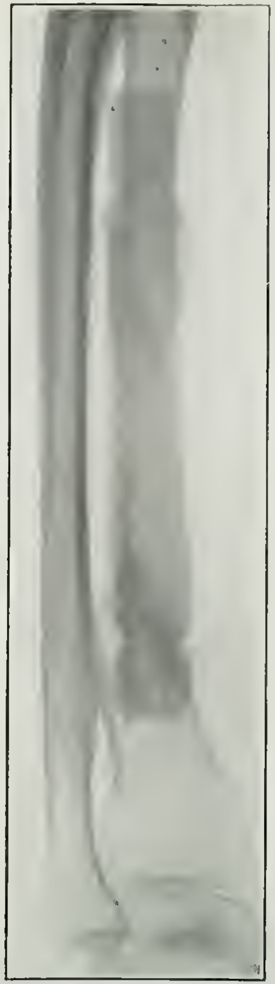

*Fig. B.*—Same case as *Fig. A*, after second operation (lateral tibial graft into radius)

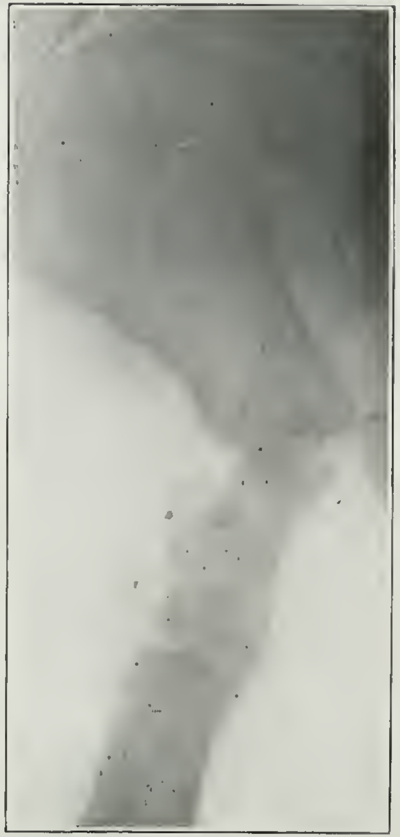

*Fig. C.*—Bomb wound, 2 in. blown away from left humerus. Two operations: wired, and, later, gap filled with chips from iliac crest. The skiagram, taken eight months after first operation, shows fibrous union, but limb stable (chips survive).

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active life, and served as a combatant in the late war. Another case was that of a girl of fifteen, who, having lost the greater part of the shaft of the tibia when five years old, had it replaced by a bone taken from an old Parisian skeleton, with complete success. In several cases metal rods have been used to restore the continuity of a long bone, and in some of these the metal has been permanently encased in new bone, whilst in others it has had to be removed because of sinus formation, but not before it has accomplished its object as a strut round which the new bone had been formed.

Forrester-Brown[32] describes a series of gap fractures in the long bones, resulting from gunshot injury, in which bone-grafting was used (*Plate XVIII*). In addition to the ordinarily accepted methods, such as the use of sliding or inlay grafts, she lays some stress on the value of bone chips placed in the gap or used as an adjunct to other methods. The chips of bone required for this method can be obtained from the crest of the ilium, and the method is one which is very attractive in its general applicability; but the narrated cases and the skiagrams do not afford very convincing evidence of the formation of new bone from these chips. It would seem that the chief value of bone fragments in grafting is to fill up spaces and crevices between the graft and the host bone, where they may function as a kind of cement material.

Henderson[33] describes the experiences in bone-grafting for ununited fractures in several hundred cases at the Mayo Clinic. He makes out a good case for the use of the largest possible graft, that is, a massive graft placed in lateral apposition to the host bone, and fixed to it by ivory nails or bone screws (*Fig.* 28). In the various long bones of the body he has had the following percentages of successful results:—

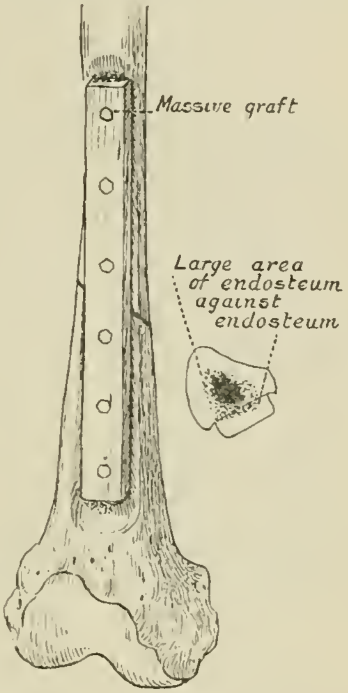

*Fig.* 28.—Massive autogenous graft applied to femur and held in place by six beef-bone screws. This graft gives abundant contact of endosteum to endosteum. (*Redrawn from the 'Journal of the American Medical Association'.*)

| Bone | No. of Cases | Percentages of Success |
|---|---|---|
| Tibia .. .. | 102 | 85 |
| Ulna .. .. | 18 | 81 |
| Radius .. .. | 35 | 78 |
| Humerus .. .. | 34 | 69 |
| Femur .. .. | 36 | 57 |

MacWilliams[34] has collected no less than 1390 cases of bone-grafting, and has analysed these in regard to the results obtained. Throughout the whole series there were 82 per cent of successful results. The actual method used for fixation of the graft appears to produce surprisingly little influence on the result, and one is tempted to ask whether the term success implies merely the healing in place of the grafted bone, or whether it also implies a strong functional result. It seems quite clear that the presence or absence of the periosteum has no effect upon the successful result. The osteoperiosteal method of grafting favoured by the French is said to have given the highest percentages of success, as judged by the author's own statistics. In this method a strip of periosteum is taken, together with flakes of adherent bone, and this tissue is implanted into the gap to be filled. In cases where the grafting operation is followed by sepsis, failure does not necessarily result, but the proportion of successes amounts only to 32 per cent.

## HABITUAL DISLOCATION OF THE PATELLA.

Karl[35] collects 296 cases of this deformity, which he divides as follows: congenital 137, traumatic 86, pathological 44. The congenital cases always show some defect in the development of the external condyle of the femur and weakness of the vastus internus. Many patients learn to walk quite well, with remarkably little disability. The traumatic cases result from a blow on the knee or from muscular violence, the internal vastus and inner portion of the capsule being torn. The pathological varieties occasionally arise from some inflammatory condition such as gonorrhœa or osteo-arthritis, but more frequently after infantile paralysis affecting the vastus internus. The treatment requires some plastic operation, but the number and variety of methods proposed are somewhat bewildering. Karl recommends the operation devised by Klapp. A free strip of fascia lata is taken of sufficient length to surround the patella and permit of fixation to the internal condyle. The fascial band is passed through a slit in the quadriceps tendon, round the outer margin of the patella, and through a slit in the patellar ligament. The two free ends of the band are fixed to the periosteum over the internal condyle.

## PES CAVUS.

The deformity of claw-foot is one which is complicated in its origin and treatment. For a long time it has been recognized that the mere division of bands of fascia in the sole of the foot is quite inadequate to cure this condition. Todd[36] urges that a severe condition of pes cavus requires two essentials in its operative correction. The tissues of the sole must be permanently lengthened, and, secondly, the extensor muscle must be given a direct attachment to the necks of the metatarsal bones, so that they will lift the front of the foot and not merely hyperextend the toes. The first part of the operation is done by dividing the attachments of all the short muscles and fascia to the lower surface of the os calcis. When this has been done, the exaggerated arch of the foot can be straightened, the structures in the sole sliding forwards *en masse*. The second part consists in dividing the attachments of the extensor tendons to the toes and fixing each tendon to the neck of the corresponding metatarsal bone.

## PARALYSIS OF THE INTRINSIC HAND MUSCLES.

After injuries to the ulna and median nerves there is usually left a great degree of permanent paralysis of the intrinsic muscles of the hand. From a functional point of view, the most serious loss is that of the power of opposition of the thumb to the fingers. Ney[37] has suggested a very useful operation for the correction of this disability in those cases where intrinsic hand-muscle paralysis is associated with good function in the long flexors. The inability of the thumb is due largely to an over-action of the extensor muscles as well as to the absence of the adductor and opponens actions. The principle of the operation consists, then, in converting one of the extensor muscles of the thumb into a flexor and adductor. This is done by making a junction

# *PLATE XIX*

## PARALYSIS OF INTRINSIC HAND MUSCLES

(NEY'S OPERATION)

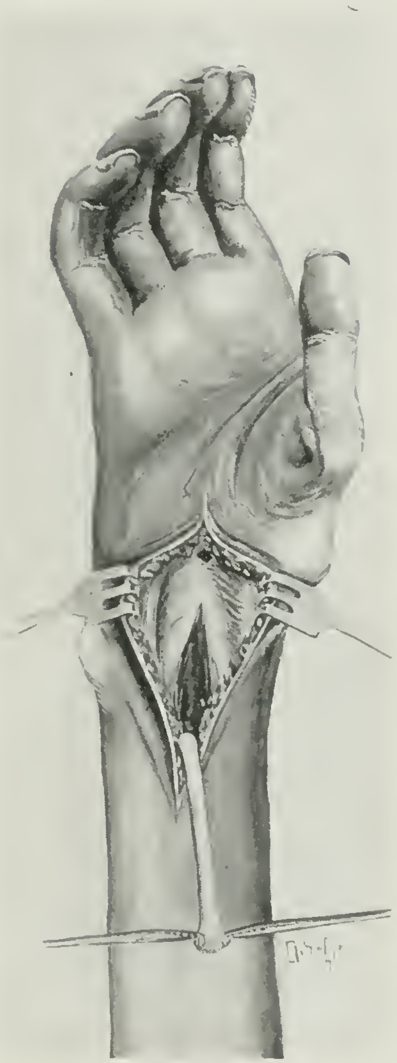

*Fig. A.*

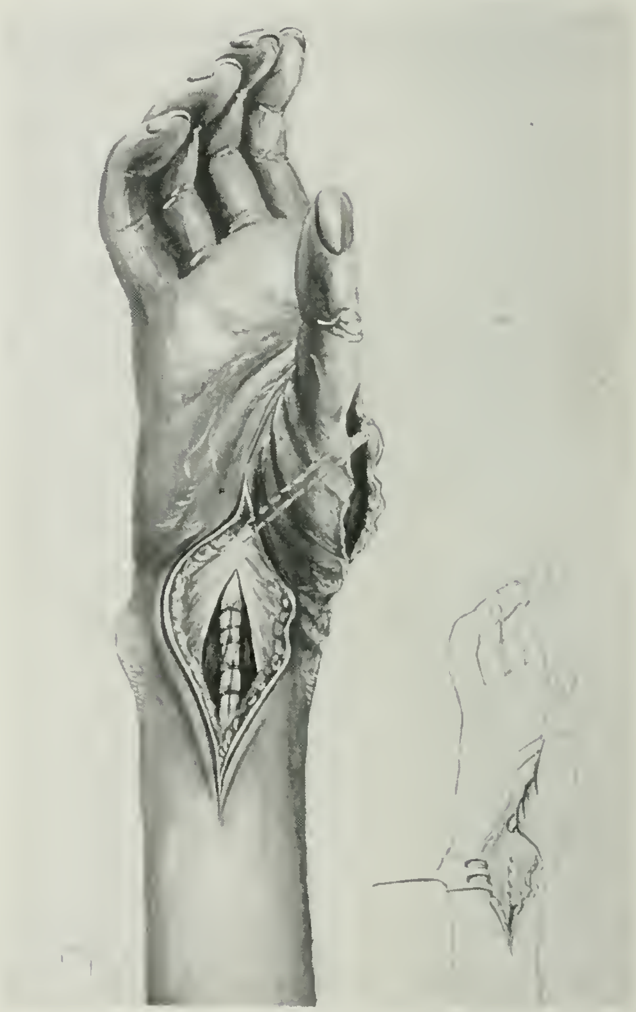

*Fig. B.*

*Fig. B* shows the transplanted short extensor of the thumb passed subcutaneously over the thenar eminence, under the annular ligament, and anastomosed to the palmaris longus.

*By kind permission of 'Surgery, Gynecology, and Obstetrics* between the tendon of the palmaris longus and that of the short extensor of the thumb, the latter tendon being brought round through a tunnel in the thenar muscles and annular ligament (*Plate XIX*).

References.—[1]*Brit. Med. Jour.* 1921, ii, 7; [2]*Jour. Amer. Med. Assoc.* 1921, Sept. 10, 898; [3]*Ibid.* Nov. 5, 1521; [4]*Johns Hop. Hosp. Bull.* 1922, April, 140; [5]*Presse méd.* 1922, March 22, 246; [6]*Brit. Med. Jour.* 1921, ii, 978; [7]*Surg. Gynecol. and Obst.* 1922, Jan., 79; [8]*Centralb. f. Chir.* 1921, July 16, 990; [9]*Jour. Amer. Med. Assoc.* 1921, Oct. 8, 1168; [10]*Jour. of Orthop. Surg.* 1921, iii, 353; [11]*Ibid.* 365; [12]*Rev. d'Orthop.* 1921, xxviii, 213; [13]*Ibid.* viii, 353; [14]*Münch. med. Woch.* 1922, June 23, 930; [15]*Presse méd.* 1922, Jan. 14, 35; [16]*Brit. Jour. Surg.* 1922, Jan., 366; [17]*Lyon. Chir.* 1922, March–April, 120; [18]*Arch. f. klin. Chir.* 1921, Dec. 24, 647; [19]*Brit. Jour. Surg.* 1921, Oct., 242; [20]*Surg. Gynecol. and Obst.* 1922, Jan., 37; [21]*Ibid.* 1921, Sept., 223; [22]*Revista Espanola d. Med. y Chir.* 1922, April, 179; [23]*Arch. f. klin. Chir.* 1921, July 26, 602; [24]*Guy's Hosp. Rep.* 1921, July, 339; [25]*Arch. f. klin. Chir.* 1921, Nov. 24, 563; [26]*Surg. Gynecol. and Obst.* 1922, May, 574; [27]*Brit. Jour. Surg.* 1921, July, 7; [28]*Boston Med. and Surg. Jour.* 1921, Dec. 8, 683; [29]*Ann. of Surg.* 1921, Sept., 294; [30]*Brit. Jour. Surg.* 1922, Jan., 408; [31]*Arch. f. klin. Chir.* 1921, Oct. 17, 13; [32]*Brit. Jour. Surg.* 1921, Oct., 179; [33]*Jour. Amer. Med. Assoc.* 1921, July 16, 165; [34]*Ann. of Surg.* 1921, Sept., 286; [35]*Arch. f. klin. Chir.* 1921, Nov. 24, 667; [36]*Clinical Jour.* 1921, Dec. 21, 778; [37]*Surg. Gynecol. and Obst.* 1921, Oct., 342.

## BOTULISM. (*See* Food Poisoning.)

## BRADYCARDIA.

*Drs. C. Lian and L. Pollet.*

(*Translated by Carey F. Coombs, M.D., F.R.C.P.*)

**Total Bradycardia.**—Since Sir James Mackenzie's work, cases of slowing of the whole heart, in contrast to slowing of the ventricles by auriculo-ventricular dissociation, have been recognized. These cases Mackenzie named—mistakenly, as will be seen later—cases of 'normal' bradycardia. Usually one speaks of the condition as 'total' or 'sinus bradycardia', and, as the writer [C. L.] has shown,[1] this syndrome should be set alongside that of the slow pulse due to auriculo-ventricular dissociation. In it the pulse-rate is generally about 50; it quickens with exercise, and nearly always with atropine and with amyl nitrite, whereas in dissociation the pulse-rate is often below 40, and little or not at all affected by exercise, atropine, and amyl nitrite.

Many writers think with Mackenzie that this form of bradycardia is never complicated by vertigo or syncope, such as so often occurs in bradycardia by dissociation, constituting the 'Stokes-Adams syndrome'. Thus, Vaquez[2] has recently written: "Total bradycardia does not seem to have any importance . . . absence of syncopal attacks or even of giddiness is the rule". A whole series of personal observations have led the writer to adopt quite a different view,[3] namely, *that it is by no means rare to note nervous trouble complicating total bradycardia.* Such troubles are, as a rule, slight—dazzles before the eyes, giddiness, a tendency to syncopal attacks. But some of his patients have had several syncopal attacks, patients whose venous pulse showed a normal *a-c* interval, i.e., absence of any defect of auriculo-ventricular conduction. One is not surprised at these happenings, for by considerable pressure on the eyeball pauses of 2 to 4 seconds, sometimes of 5 to 10 seconds, may be produced, and even syncope may follow. The writer has therefore come to regard total bradycardia as arising from vagal hypertonus. Under the influence of emotion, or reflexly from visceral disturbances, this hypertonus may be suddenly increased, provoking, as in ocular compression, a syncopal condition or a true syncope.

Such occurrences are still easier to understand when they are seen in cases where, in addition to total bradycardia, there is a slight defect of *a-v* conduction—simple lengthening of the *a-c* interval without auriculo-ventricular dissociation. Such cases bridge the gap between heart-block and total bradycardia. These various data lead one to attribute syncopal attacks in certain patients with a normal pulse-rate between attacks, to a latent vagal hypertonus susceptible of periodical exaggeration. In these patients there were elements of the syndrome of vagal hypertonus, particularly a strongly positive oculo-cardiac reflex.[4]

These ideas have a considerable bearing on prognosis. To believe that syncopal attacks complicate only the bradycardia of *a-v* dissociation might expose one to the risk of a serious mistake in prognosis. As a fact, many cases of bradycardia due to heart-block end fatally. On the other hand, the syncopal phenomena of total bradycardia are of far less serious import. It is of course not impossible that in such a case fatal syncope might occur, but this has not yet been observed, unless it be that in certain sudden deaths, e.g., under anæsthesia, vagal hypertonus has been a contributing factor.

In conclusion, these data have a good deal of therapeutic importance, for they indicate the use of **Belladonna** and **Atropine.** Subcutaneous injection of 1 mgrm. of atropine sulphate may be used to combat a tendency to successive syncopal attacks complicating total bradycardia ; 1 or 2 mgrm. might be given in two to four doses spread over twenty-four hours. Or belladonna might be given : two or three of Trousseau's pills, each containing a dose of 0·01 grm. each of powdered drug and of the extract, daily ; or twenty drops of the tincture, two or three times a day. The sympatheticotonic action of **Adrenalin** (intramuscular injection of ½ mgrm. of the hydrochloride) might also be used to counterbalance vagal hypertonus.

**Bradycardia due to Auriculo-ventricular Dissociation.**—Gallavardin's interesting summary[5] of 50 cases seen by him has recently added much to our knowledge of this subject. Three chief points may be emphasized :—

1. *Syphilitic Cases are Rare.*—It has become the rule to regard permanent heart-block as syphilitic in origin. Yet of 39 cases studied from the etiological point of view, only three were certainly syphilitic, and one doubtful. His conclusion is that the Stokes-Adams syndrome should be considered syphilitic only occasionally. This is in agreement with the writer's experience, and with the findings of himself and Vernes[6] to the effect that, excluding non-rheumatic aortic incompetence and aortic aneurysm, which are nearly always syphilitic, arterial and cardiac sclerosis are often syphilitic before, but rarely after, fifty. Of Gallavardin's 50 patients, half were aged from 50 to 70, a quarter less than 50, and a quarter more than 70.

2. *Pressure on the Vagus.*—Gallavardin advises pressure, at first cautious, later more forcible, on the carotid (for there is no means of compressing the vagus, except by crushing the carotid). In this way the slowing may be exaggerated, and pauses of three or four seconds provoked. The patient, feeling slightly giddy, says, " Yes, doctor, it is just like that when the attacks come on ". The clinical phenomena are thus seen for the moment under a high magnification. Gallavardin thinks that when pressure on the nerve causes prolonged intermissions and giddiness, the diagnosis of Stokes-Adams syndrome becomes more and more probable, for such long pauses are rarely seen except in lesions of conductivity.

[Gallavardin's observations and deductions are interesting to compare with ours in the paragraph above. In persons with persistent total bradycardia, or asthma, or other evidence of vagal hypertonus, I have often seen ocular pressure readily provoke pulse-pauses of three or four seconds. Venous pulse curves gave no evidence of defective *a-v* conduction. My view of these cases was that they had a vagal hypertonus which might come into periodical evidence under the influence of some visceral disturbance, reflexly increasing vagal tonicity ; and my conclusion was that the Stokes-Adams syndrome complicated not only the bradycardia due to lesions of the *a-v* conduction paths, but also—though less often—that associated with vagal hypertonus, actual or latent.

I do not, however, consider that there is any real discrepancy between these two series of observations. Gallavardin and Petzetaxis have indeed shown that the oculo-cardiac reflex may, even in the absence of any pre-existing lesion of conductivity, provoke not merely pauses of the whole heart, but also a certain degree of auriculo-ventricular dissociation. It is therefore not unreasonable to suppose that in my cases of total bradycardia with giddiness and syncope the more serious attacks may have been caused by a transitory auriculo-ventricular dissociation, due to a sudden exacerbation of permanent hypertonus of the vagus.

My observations may therefore be regarded as valid. The Stokes-Adams syndrome is very often seen in cases of *a-v* dissociation, and fairly often, in slight degree, in cases where conductivity from auricle to ventricle is delayed but not interrupted ; but it also occurs, and is indeed not very uncommon, in connection with total bradycardia.

It should be added that I have several times produced by the oculo-cardiac reflex long cardiac pauses where vagus compression had failed. It is therefore clear that firm ocular compression is a better means of exciting the vagus than direct vagal compression. The only advantage of the latter is that it involves little or no discomfort to the patient, whereas ocular compression is painful. Vagus compression may therefore be tried first, and. if it fails, ocular pressure may be resorted to.—C. L.]

3. *Therapeutic Considerations.*—Gallavardin advises systematic application of specific treatment in cases where it is justified, tentative application where the etiology is doubtful. He says of **Digitalis** that it may increase the auriculo-ventricular dissociation, but thinks that if there is definite cardiac insufficiency there is no reason to withhold from the patient the benefits of digitalis treatment. He writes that he has several times treated cardiac insufficiency in patients with total block of old standing with definite success and no mishap. On the other hand, single massive doses are likely to lead to trouble. The writer's experience agrees with this. There are cases of cardiac insufficiency with bradycardia due to *a-v* dissociation in which small doses of digitalis effect a definite improvement. This supports the view, expressed elsewhere (*see* DIGITALIS), that the drug has some cardiac action in addition to mere retardation. Nevertheless, crystalline **Ouabain** is to be preferred in such cases, digitalis being reserved for use where ouabain is not successful.

Finally, Gallavardin says that in cases of repeated attacks of giddiness, fifty to a hundred daily, **Atropine** has proved itself valuable. Given as the sulphate in 1 to 2 mgrm. per day, divided into several doses, it seems to be well borne. Under its influence he has seen the attacks of giddiness reduced abruptly from 110 to 10 or 15 a day.

**Sinu-auricular Block.**—Among the arrhythmias of sinus origin, of which respiratory arrhythmia is the prototype, and which are accounted of no pathological significance, is 'sinu-auricular block'. Normally the cardiac contraction originates in the sinu-auricular node of Keith and Flack, at the junction of the superior vena cava with the right auricle. But sometimes a stimulus arising at this node is not followed by an auricular contraction. The result is a pause of the whole heart due to sinu-auricular 'block' or dissociation.

☞ Calvin Smith[7] believes this form of dissociation is commoner than is usually thought. Several times he met with suspicious, indeed probable, cases among healthy recruits ; and in ten months 14 cases, proved by electrocardiogram, were studied by him. Clinically it may be suspected when the pulse, returning to its normal speed after acceleration by exercise, shows a number of pauses.

Pauses due to sinu-auricular block differ from those of respiratory or of extrasystolic arrhythmia in the following particulars. In respiratory arrhythmia the pauses always occur at the same phase of respiration, usually in expiration, and the changes in rhythm are progressive from one beat to the next; the length of the beats lessens from one beat to the next in inspiration, and increases similarly in expiration. On the other hand, the irregularity of the sinu-auricular block that produces the pause appears suddenly, without any gradual transition or relation to respiration.

Extrasystoles are superimposed on a basis of regular rhythm. They are often associated with other cardiac troubles; their occurrence is not limited to periods of exertion, and are perceptible by the patient; in all these respects differing diametrically from sinu-auricular block.

Sinu-auricular block is neither a symptom nor a sequel of infection. Though it has often been noted in children convalescent from diphtheria, it is also seen in healthy persons with no cardiovascular symptoms. It has been noted in the course of tachycardias such as follow within twenty minutes after a hypodermic injection of strychnine or atropine. In some persons it follows physical exercise, cerebral effort, emotion, or the exhibition of certain drugs. It is therefore due to agents affecting the nervous control of the heart. Calvin Smith concludes that it is not a pathological phenomenon, but a physiological change observed in certain healthy hearts. Its discovery does not therefore call for treatment of any kind.

**Atropine.**—The use of the atropine test in the diagnosis of bradycardia has shown that for a few minutes after the injection there may be a slight slowing of the pulse, giving place to acceleration when the test is positive. Further, it was shown that a dose of 1 mgrm. of atropine sulphate, injected subcutaneously, might not be enough to cause acceleration, and that an injection of 2 mgrm. must then be given.

McGuigan's[8] researches on six healthy persons are in accord with these facts. He found that a 2-mgrm. dose, given subcutaneously, might be needed to provoke acceleration of the pulse of a healthy person. He also noted that: (1) A dose of 1 mgrm., where it fails to quicken the pulse, always slows it more or less; (2) A dose of ½ mgrm., given by the mouth or under the skin, never causes anything but slowing of the pulse. His investigations show that doses too small to quicken the pulse suffice to make the mouth dry.

From the point of view of treatment these points deserve emphasis. If atropine is to be used to inhibit the effect of the vagus on the heart, at least 1 mgrm. must be prescribed, whether by mouth or hypodermically. This dose usually causes marked drying of the mouth but no ocular symptoms. Very often it takes a dose of 2 mgrm. to cause dilatation of the pupil. These statements, it must be understood, apply to average results, and it is always wise to begin with small doses of atropine so as to avoid trouble such as may arise from an idiosyncrasy on the part of the patient.

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## BRAIN SURGERY.

*J. Ramsay Hunt, M.D.*

**Cerebral Tumour.**—A review of the treatment of brain tumours by Dandy[1] purposes to present a new and hopeful outlook. It deals, not with a new form of treatment, for there can be, at least for the present, only one treatment, namely surgical, but rather with an intensive development of this field, largely by the innovation of new diagnostic methods and the institution of surgical efforts directed solely to the eradication of the cause.

He says that surgery has signally failed in its task of curing brain tumours. An occasional brilliant tumour extirpation is no answer for the great mass of failures; it scarcely more than vindicates the unsatisfactory treatment in its present form, but it does indicate the possibilities of this branch of surgery with the correlation of accurate diagnosis and proper treatment. And how can it be otherwise when far more than half of all brain tumours have not been localizable (but operative procedures are carried out, notwithstanding)? Under such circumstances, satisfactory results must be fortunate occurrences attained in spite of the necessary indecisions, mistakes, and inefficient methods which prevail.

There are, indeed, tremendous obstacles in the path of brain surgery. The technical difficulties are always great. The extensive silent areas of the brain make the localization of tumours, by objective signs, both late and difficult. Exploration of the depths of the brain is hazardous and unjustifiable because of its destructive effects, unless one is certain of striking the lesion precisely, and of not doing more harm than good. A large percentage of brain tumours are infiltrating, and their removal requires the additional extirpation of a zone of healthy brain tissue. Many areas of the brain cannot be injured without sequelæ which may permanently incapacitate the patient and render him a burden to himself and society.

The only rational treatment of brain tumours is dictated by the inexorable law of their growth. They are always progressive, and practically always end in the death of the patient. Drugs, *x* rays, and radium are utterly ineffectual. There is only one way of curing a patient with a brain tumour, and that is by its complete removal. The natural and only sensible deduction from this fact is that the earlier the tumour is removed, the better are the patient's chances of life and of complete recovery. Any other form of therapy can only reduce the chances of a cure.

*Uses, Fallacies, and Dangers of Decompressions.*—A decompression is merely a palliative form of treatment, and is never performed with the hope of curing the patient with a brain tumour. Two types are usually described: either under the temporal muscle—a subtemporal decompression; or under the occipital muscles—a suboccipital or subtentorial decompression. No matter how skilfully a decompression may be performed, the underlying brain will be irreparably damaged. The brain always becomes adherent to the overlying temporal muscle, and collections of fluid of varying size form between the adhesions—an effort of Nature to protect the brain as much as possible from the surgeon's damage. At times an actual cyst will form, to all appearances and for all practical purposes a protecting bursa on the brain. It is true that important symptoms rarely follow; the operations are over silent areas of the brain which stand extensive insults before symptoms develop; but the damage to the brain tissue is certainly too great to be inflicted on any patient unless there is a very definite and urgent reason.

*Suboccipital (or Cerebellar, or Subtentorial) Decompressions.*—When the intracranial pressure resulting from the tumour is high, a suboccipital decompression is always fraught with the greatest danger. A very high immediate mortality will result, regardless of the situation of the tumour. Doubtless the dislocation of the brain toward and through the occipital bony defect injures the medullary centres, for in fatal cases the course of events in terms of pulse, respiration, and temperature is precisely like that which follows injury to the medulla from the removal of tumours in this region.

*Subtemporal Decompressions.*—These have attained the greatest popularity in the treatment of brain tumours. Unfortunately, a subtemporal decompression has come to be regarded as a simple and harmless procedure which should be performed more or less as a routine in all cases of intracranial pressure. There is no greater mistake. The operation itself is indeed simple enough, and can doubtless be executed with equal facility by any number of surgeons: but it is far from a safe performance, and as a routine treatment it is anything but a sane procedure. As a more or less routine operation for brain tumours, little can be said in its favour.

About half the total number of brain tumours are located in the brain-stem or cerebellum, and therefore give rise to hydrocephalus, because the aqueduct of Sylvius and the foramina of Magendie and Luschka become occluded. There is no conceivable way by which even the slightest benefit can be derived from a subtemporal decompression in any case of hydrocephalus, for the cause of the hydrocephalus—the obstruction—has in no way been affected; but in all such cases the brain is irreparably damaged by the decompression. In hydrocephalus, the cerebral ventricles dilate as rapidly as the protective coverings of the brain, i.e., the dura and skull, will permit. Remove these, as in a decompression, and the brain protrudes as far as the new coverings of muscle and skin will permit; but there is in nowise any reduction of intracranial pressure.

*Functions and Dangers of Exploratory Craniotomy.*—As its nomenclature indicates, this type of operation is a crude method by which an occasional tumour may be found when no signs have betrayed its location. Exploratory craniotomies have been of distinct, though limited, service in cranial surgery. A craniotomy properly performed should locate or exclude any superficial growth in about a third of the brain's surface. The entire outer surface of one hemisphere, and the inferior surface of the frontal, temporal, and occipital lobes can usually be inspected; but, at best, the other two-thirds of the brain's surface and all of the interior of the brain must escape observation. A distinct advantage lies in the fact that a decompression, should it be indicated, can be performed simultaneously and with no extra hazard to the patient. While a combined craniotomy and decompression is more dangerous than a decompression alone, the possibilities are greater. The information gained is often definite, in contrast to the continued uncertainty of intracranial conditions after a decompression alone.

With the advent of the newer methods of diagnosis, an exploratory craniotomy is never necessary; a correct diagnosis likewise leaves no excuse for performing a craniotomy when hydrocephalus is present. When a craniotomy is performed, it should be made with a clear idea of the tumour's location, so that the operative exposure of the tumour will be both ample and direct.

*Puncture of the Corpus Callosum—Balkenstich.*—This has been proposed as a palliative treatment, even as a cure, for hydrocephalus. It has not the slightest value in either function. It is based on an entirely fallacious concept. In the first place, fluid released from the roof of the third ventricle passes into the subdural space, where it cannot be absorbed, except in small amounts, because this space is lined on both sides by an avascular membrane. To be absorbed, fluid must reach the subarachnoid space, and cerebrospinal fluid can enter this space only through the cisternæ, which act as central distributing stations for the subarachnoid spaces. Fluid so released becomes encysted. Even should adequate absorption be possible in the subdural space (which cannot be), the opening in the corpus callosum must inevitably close, since the neuroglia proliferates in obedience to Nature's method of healing wounds. Hydrocephalus due to a tumour can at present be cured only by removing the cause.

*Lumbar Puncture.*—This also should be used with great caution. In patients with brain tumour it has no useful purpose, but is accompanied by danger. Dandy has seen at least four deaths following lumbar puncture, and many other patients have had distressing symptoms for many days. The danger lies in the sudden entrance of portions of the cerebellar lobes into the foramen magnum when the spinal fluid is released ; the herniated cerebellum, being caught in the bony ring, compresses the medulla and upper spinal cord.

*Ventricular Puncture.*—This is a most useful procedure—not as a therapeutic measure but as a diagnostic aid. In adults, it can easily be performed under local anæsthesia ; in growing children, puncture can often be made with a sharp needle through a patent anterior fontanelle. In no conceivable way, of course, can more than a very transient therapeutic benefit be derived from a ventricular puncture, for all the cerebrospinal fluid which is removed re-forms again within a few hours. The dangers of a ventricular puncture are distinctly less than in any other operative procedure. The principal danger is the occasional puncture of an intraventricular tumour, causing intraventricular hæmorrhage which can quickly result in death.

*The Rational Treatment of Brain Tumours.*—What, then, is the treatment for brain tumours ? The answer is simple, and permits of no equivocation : (1) An early diagnosis of brain tumour ; (2) A precise localization ; (3) An accurate and adequate operative approach to the tumour *in toto* if possible ; and (4) When the tumour cannot be removed, to produce the maximum palliation at the same operation. We must learn to detect the early symptoms and signs of intracranial pressure, as well as the focal manifestations. It is due to the patient that headaches or pains in the head, unexplainable vomiting, unusual malaise, visual disturbances—dimness of vision, hemianopsia, diplopia, transient amblyopia—any focal, motor, or sensory disturbances, all unusual epileptic attacks, any disturbance in gait, etc., should be thoroughly investigated by one of adequate experience to pass judgement on the intracranial possibilities in a decisive manner.

In every case in which a careful anamnesis and neurological and *x*-ray examinations are of no avail (and this group comprises half the cases of brain tumours), the tumour can be diagnosed and located or its existence eliminated by cerebral pneumography (*see* MEDICAL ANNUAL, 1922, p. 298). These statements are not intended to convey the impression that air is to be injected into the brain of every patient who has symptoms which may be regarded with suspicion. A neurologist or neurological surgeon of large experience can differentiate the vast majority of cases of tumours from other lesions. The procedures are used only when imperative, and when all other means fail to reach a diagnosis and localization. The physician and the patient will no longer be content with the diagnosis of an unlocalizable brain tumour and with the train of indirect and useless operations which are the sequel of this diagnosis. Nor will they be willing patiently to await paralyses, blindness, and aphasia to make the localization. When confronted with the facts, there are few patients and few parents who would prefer the partial or transient results of palliative (all too frequently pseudo-palliative) treatment to the permanent results of a tumour extirpation, after giving due consideration to the relative risks assumed. Just as the urologist accurately localizes lesions of the kidney and ureter by filling the urinary channels with thorium or collargol, so the neurological surgeon now fills the spaces of the brain—the ventricles on the interior and the subarachnoid spaces on the exterior—and localizes the intracranial lesion by the effect, either direct or indirect, of the tumour on these fluid-containing spaces. And all brain tumours must produce pathognomonic changes on some part of these spaces. By a series of roentgenograms, the entire system of spaces can be demonstrated, and any abnormality in these spaces will at once be apparent. Dandy has now had opportunity in more than 200 injections to locate tumours in every part of the brain, and he has yet to fail to make an accurate localization, nor has he failed to find this tumour at operation.

**Uses of Salt Solution in Conditions of Increased Intracranial Tension.**—These are considered by F. E. B. Foley.[2] It has been shown experimentally that the pressure of the cerebrospinal fluid and the bulk of the brain can be reduced by the intravenous injection of a hypertonic solution. The occurrence of these changes was first demonstrated by Weed and McKibben in experiments on cats. Foley's purpose is to describe these physiological responses as seen in the human subject. The first report of the clinical use of this principle was by Haden. In cases of cerebrospinal meningitis in which pressure symptoms developed (presumably due to blocking of the pathways of escape for cerebrospinal fluid), symptomatic improvement followed the intravenous injection of 40 per cent glucose solution. The observations on patients recorded here were conducted coincidently with an extension of the experimental phase of the subject. In these experiments the effect of gastro-intestinal doses of salt solution, or salt ingestion, was investigated, for it was feared that the medullary depressant effects of intravenous doses might preclude their clinical use. Subsequently this fear has been shown to be not entirely warranted. The experiments demonstrated, however, that gastro-intestinal doses of salt work the same reduction in cerebrospinal fluid pressure and brain bulk as intravenous doses. The changes are not accompanied by medullary depressant effects.

This procedure has a definite clinical usefulness. The results to be expected in a given case are determined largely by the pathological conditions giving rise to the increased tension. A distinction should be made between fluid tension *per se* and increased tension resulting from enlargement of brain bulk. In the former, obstruction to fluid absorption is primary and is the essential feature. It is best illustrated by cases of internal hydrocephalus resulting from obstruction of the iter. In the latter an increased brain bulk is primary and is the essential feature. In both cases the pressure of the brain against the skull diminishes the volume of the subarachnoid spaces, and obstruction to fluid absorption through the arachnoid villi probably ensues. From the standpoint of promoting fluid absorption from these obliterated spaces, little is to be expected from the use of salt solutions. The presence of a large amount of intraventricular fluid in the hydrocephalus cases makes them amenable to relief by this means, for the fluid can be absorbed from within the ventricles. In the cases of increased tension from enlarged brain bulk, it would appear that relief can be secured only when the fluid spaces are not completely obliterated and contain an appreciable amount of fluid, or at least when the limited absorption here is combined with an appreciable dehydration of brain substance. In the cases of very extensive tumour growth, 'dry' brains with flattened convolutions and obliterated fluid spaces, the perivascular and other fluid-containing spaces of the brain substance are probably collapsed, and little should be expected from dehydration.

Increased pressure associated with inflammatory processes in the meninges may represent a third type of fluid tension. Here the obstruction is near the arachnoid villi, and is due to the inflammatory reaction about these structures. Weed was able to cause such obstruction experimentally by injecting carbon granules into the subarachnoid spaces. Such cases appear to be another example of fluid tension *per se*.

The procedure has been employed in many cases in addition to those presented. In a general way they have borne out the above interpretation of the parts played by different pathological arrangements. Practically the administration of large doses of salt has been the most valuable therapeutic agent so far used in the treatment of 'pressure headaches'. Their action in the cases of headache associated with internal hydrocephalus has been very striking. Where the headache is unassociated with this condition some degree of relief is usually to be expected. Where it is desirable to make a lumbar puncture for diagnostic purposes in cases with increased tension, the dangers of the procedure can be obviated in certain of the cases by first reducing the pressure by giving a hypertonic solution. It probably has some value in diminishing tension and aiding exposure at operation. By this means the risks of opening a very tight dura might be avoided. Where a decompression protrusion exists, the presence or absence of an internal hydrocephalus can be demonstrated. If the ventricles are greatly dilated, the protrusion will practically disappear after a large dose of salt, whereas if it is due to solid tumour growth the protrusion merely becomes softer and slightly smaller.

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## BREAST, SURGERY OF.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

### BENIGN DISEASE OF THE BREAST.

Bloodgood[1] refers to benign lesions of the female breast for which operation is not indicated. He divides the cases into groups: (1) *Pain.* The best treatment for pain in the breast is to assure the patient, after a careful examination, that it is not a sign of cancer, and that she runs no more risk of cancer than any other woman of her age with no pain. (2) *Painful scars after operation* are not, in themselves, an indication of recurrence. (3) *Discharge from the nipple.* The probabilities are that a discharge from the nipple is due to a small papilloma in the duct. There is no evidence that these lesions are precancerous, and the prevailing view that a woman with a discharge from the nipple should be protected from cancer by the removal of the breast is based on fear, and not on fact. (4) *Retraction of the nipple* may be associated with benign tumours, but it is better to look on it as a sign of cancer. (5) *Lesions of the nipple suggesting Paget's disease.* Any warty condition of the nipple associated with scaling, discharge, or ulceration; any irritation of the nipple with redness or weeping; anything suggesting eczema or ulceration of the nipple, which does not heal within a few weeks after simple measures of cleanliness and protection, should be looked on as Paget's disease and be treated by complete excision of the breast. If, on palpation, there is any induration beneath the affected nipple, any palpable mass in the breast, the complete operation for cancer should be performed without delay.

Pribrim[2] discusses *hæmorrhage of the mammary gland.* Bleeding of the nipple in young girls is generally vicarious and does not require any treatment. Between the ages of 40 and 50 it is generally due to polycystic degeneration of the mammæ. Carcinoma and sarcoma of the breast seldom bleed. Cases in which bleeding occurs are generally cases of cystic tumours.

Lewis[3] also suggests that the discharge from the nipple is not, in itself, a definite expression of malignancy, and should not be treated as such unless the suspicion is strengthened by the rest of the history and clinical picture.

Peek and White[4] are conservative in their treatment of *cystic mastitis, papillary cyst adenoma,* and also point out that blood discharge from the nipple, without a palpable mass, is not evidence of malignancy, and does not call for operative interference. With the presence of a tumour it calls for operation.

They summarize their observations as follows: (1) Benign tumours or cysts of the breast can be definitely diagnosed at the operating table in a high percentage of cases, and should be treated by conservative surgical procedures. Mutilating radical operations for such conditions are unnecessary, and are a confession of ignorance or timidity on the part of the surgeon. (2) A trained pathologist should be present at the operating table to assist the surgeon in determining at once the nature of the pathological process. (3) Cysts of the blue-domed type, and localized and generalized chronic mastitis are neither malignant nor precancerous conditions, and should not be so considered. (4) Non-encapsulated tumours of the adenomatous type form a borderline group. They are by no means always precancerous lesions, and in younger women radical operations should be avoided if possible. In older patients, and when the amount of breast tissue involved is considerable, radical operation may be indicated.

Bloodgood[5] writes of 'the blue-domed cyst' in cases of chronic cystic mastitis. In the blue-domed cyst the characteristic gross feature is a distinct blue dome. In the majority of cases this is exposed after division of the subcutaneous fat. In a certain percentage of cases the cyst is buried in the breast tissue, and division of a zone of breast is necessary to expose it. As a rule the cyst wall is thin; in less than 10 per cent of the cases it has been found thicker than 2 to 3 mm. The contents of the cyst have never been hæmorrhagic; they are either clear or cloudy. The inner wall of the cyst is smooth, without papillomata, and there may be partial partitions or septa.

The cyst of the galactocele type differs from the blue-domed cyst in that the dome of the former is white or grey, and as a rule the wall is a little thicker. The contents not only resemble milk in appearance, but also are coagulated by formalin, while the contents of the blue-domed cyst are not.

Most multiple cysts in one or both breasts (diffuse cystic disease of the breast) are of the blue-domed type, but a few may be of the galactocele type. The breast or breasts are riddled with cysts of various sizes. The character of the wall and the contents are identical with those of the blue-domed type. The frequency of this multiple cystic disease is about 13 per cent.

Lee and Adair[6] report three further cases of *traumatic fat necrosis of the female breast*, and emphasize the similarity of this condition to carcinoma. The condition is rare compared with cancer; corpulency is an important factor. One of the chief diagnostic points is a bona fide accurate history of trauma, and the site of injury coincides with the location of the fat necrosis. There is usually no pain; the tumour is extremely hard, and is fixed, as a rule, to the overlying skin; it may or may not be fixed to the deeper structures. There is no glandular involvement. The writers of this paper have illustrated each point with microphotographs and pictures of patients and gross specimens.

Keyser[7] discusses *massive hypertrophy of the breast*, and states that: (1) Massive hypertrophy of the breast is of two types: (*a*) fibro-epithelial, and (*b*) adipose. (2) It may occur between the ages of 12 and 48, but is most frequently associated with puberty or pregnancy. (3) The normal development of the breast seems to depend on the ovary, and there is evidence which strongly suggests that the massive hypertrophy may be etiologically related to an ovarian malfunction. (4) If spontaneous regression of the process fails to occur, surgical amputation is, at present, the preferred treatment.

## MALIGNANT DISEASE OF THE BREAST.

Winslow[8] believes that 60 to 65 per cent of all mammary tumours are carcinomatous. He thinks that the proper treatment of primary or secondary tumours of the sternum is open to question. Some authorities state that secondary tumours of the sternum are of no interest to surgeons, amongst whom is Finney, who wonders if it is ever justifiable to open the anterior mediastinum, or to remove ribs and parietal pleura. Rodman, on the other hand, in one case excised a portion of the sternum and several ribs, with part of the parietal pleura. The woman lived nearly three years afterwards. Fixation to the chest wall does not necessarily exclude excision. The portion of ribs invaded may be removed.

**The Proemial Breast.**—Cheatle[9] uses this term to indicate a condition which is a prelude to later development of simple papillomata and malignant papillomata and other forms of cancer; he thinks it more accurate than the terms pre-cancer, pre-cancerous, etc. He looks for a treatment to deal adequately with breasts in which cancer or papillomata are likely to occur, and considers we should not, as we do now, devote our attention to those breasts in which these diseases are definitely present. He is fully convinced that the proemial breast is a type which very frequently leads on to the graver conditions. He continues:—

"The proemial breast is worthy of due recognition in future pathological and clinical considerations for two reasons: (1) It is in a state that makes it a prelude to further pathological changes of a highly important character—mainly, simple papillomata, malignant papillomata, and other forms of cancer. (2) Its clinical recognition and adequate treatment occasionally enable the surgeon to recognize (microscopically) the presence of one or more of these changes, before any clinical sign of their existence is obtainable by any other means—that is to say, before the proemial breast has merged into those profoundly important stages to which it has acted as a prelude. When once established, the condition of the proemial breast is permanent.

"The patient, who has generally reached the age of from 40 to 45 years, complains of pain in the breast. Occasionally it is so severe and has lasted so long that in spite of all kinds of treatment she can bear it no longer, and insists on having the breast removed. Generally the pain is not so severe, and is of an aching character which is not always affected by menstruation. On questioning the patient, it is found that the pain began sometimes as early as 30 years of age—more often it commenced somewhat later; also that it may have lasted some six months, or one, two, three, or more years. The pain is continuous. On examination both breasts may appear multinodular. But while the nodules of the unaffected breast correspond to the signs I have described as indicating a normal breast, the nodules of the diseased breast are swollen, painful, and tender on palpation, and are not of the same size in corresponding parts of the same gland. Sometimes a nodule at the periphery is bigger than one situated nearer the nipple. Careful palpation reveals the fact that the swollen nodules are mainly composed of prominent parts of tortuous ducts. The state of affairs may be limited to a segment of the breast, or two segments, one of which may be on the opposite side of the same breast, of which the intervening parts are normal. Or the whole gland may be affected by the same disturbance. There may be an intermittent or continuous discharge of serum from the nipple. A thin layer of coagulated serum may be seen on the surface of the nipple. The discharge is always small in amount.

"In the later stages of this complaint the pain disappears and cysts are present in varying number. Massage, rather severe in its application, may induce a thick white discharge from the nipples, and constantly from the same duct orifices.

"In making particular allusion to multiple small nodules occurring in normal breasts, I have at once excluded many glands that hitherto have led to misconception in many minds, and it should not lead to the assumption that both glands are in the proemial state in the same individual, although it may be so.

"From what I have said concerning the proemial breast, it must be concluded that I regard it with supreme importance and distrust. In saying this I do not suggest that at its best it is certainly doomed to lead to grave pathological changes; but I hold that it is in a condition which is entirely favourable for their later genesis, while, on the other hand, in alarming frequency such changes have unexpectedly been found already to be present. I look upon it and treat it in precisely the same way and for the same reasons that compel surgeons to remove an appendix that has been inflamed. The proemial breast bears exactly the same relationship to cancer and papillomata of the breast as the proemial appendix does to general peritonitis. Cancer of the breast and general peritonitis are just as far beyond surgical control now as they always have been. General peritonitis is prevented by early surgical measures. My endeavour is to bring the preventive treatment of cancer of the breast similarly into line. Preventive surgery in relation to cancer elsewhere has been adopted. Take, for instance, Sir Henry Butlin's and Sir A. Mayo-Robson's work on leucoplakia of the tongue, and the latter's work and that of Sir Berkeley Moynihan on the gall-bladder and on gastric ulcer. Consciously and unconsciously surgeons are acting on the same principle when they remove early those prostate glands which are interfering with the normal passage of urine."

*Treatment.*—"My treatment of the proemial breast, in whatever stage it exists, is to remove it in the following way: I make one long curved transverse incision below the nipple, with its convexity downwards. Its length is equal to the limits of the breast; the outer end of the incision is continued into the axilla. Upper and lower flaps of skin are dissected from the limits of the breast, and the axilla is opened. The nipple is reflected with the upper flap; it is not removed, care being taken to separate it from the parts immediately beneath it. In so doing it is wise to remove any white fluid that may appear at its base or from the surface from which it has been cut; it might be infective. The breast and fascia over the pectoralis major are dissected away *en bloc*, with the lymphatic glands attached. It is essential that the removed gland should be subjected to a most careful microscopical examination for fear the breast might have passed from the proemial stage to changes of gravest issue. Should the presence of such a disaster be discovered, it is necessary then to remove the skin formerly covering the breast, the pectoralis major and minor, and to make a more complete dissection around the higher parts in relation to the axillary vein."

"My hope and belief is that in the majority of proemial breasts cancer, at all events, will not be found to be present. If, however, it should be discovered, it will be a great advantage to be thus warned of the necessity of a complete operation at a much earlier date than would otherwise have been possible."

The writer appends reports of four breasts presumed by him to be in the proemial state before operation: also the microscopical appearances he found in three of them, which proved he was wrong in that presumption.

Trout[10] discusses *the remaining breast after radical removal of the opposite side for carcinoma.* He recalls that a few years ago Bloodgood sent slides to numerous pathologists when the differential diagnosis between chronic mastitis and malignancy was in dispute. The microscopical diagnosis varied so greatly that many surgeons were convinced that there must be a close association between these two conditions. Trout quotes Sistrunk, of the Mayo Clinic, who states: "For some time I have felt that, when a patient has carcinoma in one breast and a definite mastitis in the other, both breasts should be removed, on account of the fact that I have, on several occasions, seen a carcinoma later developed in the breast where the mastitis was present ".

In the event of pregnancy occurring after the removal of a breast for carcinoma, the disease appears very likely to arise in the second breast, and carcinoma of the breast in pregnancy is extremely fatal. If these observations and deductions are correct, we believe that surgeons should warn their patients, who are in the child-bearing period and from whom a carcinoma of the breast has been removed, not to become pregnant for fear of serious trouble in the remaining breast.

Dealing with the same subject, A. R. Kilgore[11] comes to the following conclusions : (1) The patient who has had one breast amputated for cancer is, if she survives five years, from three to four times more likely to develop cancer in the second breast than a normal woman of the same age in either of her two breasts. (2) The majority of cancers in second breasts, arising three or more years after the first operation, behave, clinically at least, like primary new growths—not like metastases from the cancer in the first breast. (3) These facts demand recognition, either in the form of prophylactic removal of the second breast, or in redoubled care in observation of the second breast after operation on the first. (4) The records in this series suggest that if the 257 women living three years after the first operation had submitted to prophylactic resection of the second breast, twelve cancers and ten deaths from cancer in the second breast would have been prevented. (5) One patient in five has no involvement of the axilla at the time of the first operation, and if these patients had their second breasts excised, three out of four cases of late cancer in the second breast would be prevented.

Percy[12] urges that in breast cancer an $x$ ray of the thorax should be taken in every case. He advocates the *cautery* or *hot knife* for the following reasons. The entire operation, including the cleaning of the axilla, is performed with the cautery knife. The unheated knife does not devitalize any of the malignancy it does not remove. The hot knife does. The cold knife does not spoil the soil for the further development of cancer. The hot knife does. The knife unfortified with heat, if it touches cancer, vaccinates it into new areas. The hot knife does not. The cold knife stimulates the growth of the unremoved cancer-cells. With the hot knife this is impossible.

## PROGNOSIS.

W. E. Sistrunk[13] reports a detailed study of 218 traced cases of cancer of the breast operated on in the Mayo Clinic during the years 1911–13. Recurrences were found largely in the late cases, and evidently occurred because cancerous tissue was left in regions inaccessible to the knife. The highest percentage of cures and the lowest percentage of recurrences occurred in patients operated on early in the course of the disease before glandular involvement could be demonstrated.

The author believes that if it were possible to operate on all patients in the early stage of the disease and before the glands are involved, 75 or 80 per cent of those with cancer of the breast would obtain five-year to eight-year cures.

The lymphatic drainage of the breast is briefly reviewed, and emphasis placed on the impracticability of removing the supraclavicular glands. It is impossible to remove the lymphatics which accompany perforating branches of the internal mammary and intercostal arteries.

*Medical Science*[11] gives statistics relating to the treatment of cancer of the breast by excision supplemented by radiation. It would seem at the present time that opinion can only be based upon statistical enumerations in which individual variations are reduced to an average. This consideration applies to the question of the treatment by radiation supplementary to excision. At the present moment there is positive evidence that in individuals recurrences of cancer in the scar and neighbouring glands have disappeared under applications of *x* rays and of radium, and the patients have remained free from return of the disease. But in other individuals radiation has entirely failed, and assertions have been made that malignant growth has been stimulated and metastases have been widely distributed because the radiation has weakened local resistance and diminished general nutrition. Success in arrest by radiation of superficial disease has suggested the use of more penetrating rays to arrest disease, not only in the scar and axilla, but in the supraclavicular fossa and anterior mediastinum, as well as to prevent distant metastasis. As there is then nothing visible or palpable which is made to disappear, no conclusions can be based on individual observations. To establish treatment by radiation as a supplement to excision, there must be support from statistical evidence; instances of individual successes or failures, arguments from analogy and hypotheses, do not satisfy.

The statistics collected in this article do not support the success of radiation following excision, so far as ultimate results are concerned; but figures are still wanting in regard to this matter.

Wiesmann,[15] in discussing prognosis, reviews the results in the cases of 105 women and one man operated on between the years 1896 and 1916. He thinks the chances for permanent cure are fairly good if operation is performed early. Twenty-five of his cases were permanently cured.

Scirrhous cancer gives a better prognosis than very cellular forms, but this law is being changed by Röntgen treatment, as cellular medullary cancers are more amenable to Röntgenotherapy than scirrhous cancers. Scirrhous cancer is the most frequent form. Next most common is carcinoma simplex. In 12 cases the neoplasm was a medullary cancer, and in the rest there were transition and mixed forms. In 66 cases the axillary glands were found to be cancerous.

Röntgen treatment has not yet taken the place of surgical treatment, being used only to supplement the latter, either after or before operation. The author does not advise radiotherapy for operable cancer.

An operation was performed in each of the 106 cases, even when there was no prospect of permanent cure. The upper muscle layers were removed with the pectoralis fascia according to Heidenhain's method. The rest of the operation depended on the size of the tumour, every effort being made to effect complete removal. In only 35 cases was primary suture of the skin wound possible, and in some of these it was necessary to undermine the edges of the wound and place the skin under great tension.

Of 15 cases which returned because of recurrence in the scar, primary suture had been done in 10. As transplantation by Krause's method did not prove successful, Thiersch transplantation was substituted for it, and in recent years has been done immediately after the operation. The axilla was always drained through an opening on the lateral wall of the thorax.

Nothing special is learned from these cases in regard to post-operative treatment. Recovery was for the most part uneventful. A rise in temperature due to absorption was often observed after the operation. This usually occurred on the second day, and in uncomplicated cases did not continue for more than four or five days. In most cases the temperature rose to 38° C., and sometimes higher. Generally even the most severe operations were well borne if they were done quickly and with as little loss of blood as possible.

Röntgen after-treatment has been used in all cases since 1914, but the time has been too short to warrant definite judgement regarding it. Death followed operation in 2 cases (1·85 per cent), and in both was due to heart failure. Three other patients died in the hospital after intervals ranging from thirty-seven days to five and a half months. These were hopeless cases from the first. Seventy-nine patients (73 per cent) were discharged from the hospital as cured, and 24 (22 per cent) were discharged as improved. There were 26 operations for recurrence, among them 6 for a second recurrence: the results of these operations were not very satisfactory, but they lengthened life to a certain extent. Operation for a second recurrence was not successful in any instance.

Peck and White[4] were able to follow up 118 cases of malignant tumours of the breast. There were six deaths from immediate effects of the operation, and the writers state that three were due to embolus. The detailed statistics in this paper are most instructive, and bear out similar reports from other workers.

| | |
|---|---|
| Alive and well more than five years .. .. .. | 39 per cent |
| ,, ,, ,, ,, ,, ,, cases with metastases .. | 23 ,, |
| ,, ,, ,, ,, ,, ,, cases without metastases | 65 ,, |

G. P. Mills[16] comes to the following conclusions from a review of 169 cases of carcinoma of the breast. [Most surgeons of experience will be in agreement with these conclusions, with the exception perhaps of No. 4. Taking the question of malignant disease all round, the younger the patient the more hopeless the outlook.—W. I. de C. W.]

1. Taking a six-year standard of cure, the results of a representative series of cases of carcinoma mammæ operated on by various surgeons are as follows: (*a*) All cases, 39·8 per cent cured. (*b*) Gland-infected cases, 18·3 per cent cured. (*c*) Gland-free cases, 62·9 per cent cured.
2. The prognosis is worst for carcinoma simplex (32·9 per cent), better for a 'squamoid' (40 per cent), better still for a carcinoma simplex with overgrowth of duct epithelium (57·1 per cent), and very good for papillary carcinoma (100 per cent).
3. Clinical enlargement of axillary glands, even if hard, is no proof of their pathological involvement, nor is absence of clinical enlargement proof of their freedom from involvement.
4. Age at operation, duration of growth, and adhesion to the skin, have little effect on the prognosis.
5. Adhesion to muscle is a bad sign in the prognosis, the difference in the percentage of cures between adherent and free cases being nearly 30.
6. The prognosis is much the best in people of normal fatness; it is very bad in the obese, and probably bad in spare patients.
7. Of individual operations, one on the lines laid down by Sampson Handley gives the best results, especially in gland-free cases, but is very closely followed by Halstead's operation. Early gland-free cases, however, do extremely well after removal of the breast, pectoral fascia, and axillary glands.
8. Occasionally even an advanced carcinoma will do unexpectedly well after an admittedly imperfect operation.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1922, March 5, 859; [2]*Surg. Gynecol. and Obst.* 1921, Aug., 101 (abstr.); [3]*Lancet*, 1922, i, 1093; [4]*Ann. of Surg.* 1922, June, 641; [5]*Surg. Gynecol. and Obst.* 1922, March, 192 (abstr.); [6]*Ibid.* April, 521; [7]*Ibid.* 1921, Dec., 607; [8]*Ann. of Surg.* 1921, Sept., 341; [9]*Brit. Med. Jour.* 1922, i, 869; [10]*Surg. Gynecol. and Obst.* 1922, May, 629; [11]*Jour. Amer. Med. Assoc.* 1921, Aug. 6, 454; [12]*Surg. Gynecol. and Obst.* 1921, Oct., 417; [13]*Ibid.* 1921, Dec., 448 (abstr.); [14]*Med. Science*, 1921, Aug., 418; [15]*Surg. Gynecol. and Obst.* 1921, Nov., 368 (abstr.); [16]*Brit. Jour. Surg.* 1921, July, 91.

**BRIGHT'S DISEASE.** (*See* NEPHRITIS.)

## BRONCHO-MONILIASIS. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

N. Farah[1] records a case of this disease in Egypt which terminated fatally; for some time it had been suspected to be a case of phthisis. In four cases he obtained positive agglutinations with the monilia parasite and the patient's blood, and also complement-deviation. He classes cases as slight, moderate, and severe, the diagnosis depending on finding the fungus in the sputum, *Monilia pinovi* being the commonest form. **Potassium** and **Sodium Iodide** were useful, while he was successful with iodide injected in the form of **Lipoidol** (40 per cent iodine in oil of poppy), 2 c.c. being injected every day up to forty doses.

T. Sur[2] also reports a case of this nature, with illustrations of *Monilia tropicalis* he isolated from the sputum, in which symptoms of pleurisy and of asthma occurred, as well as of bronchitis, and phthisis was also suspected. Treatment with 20 to 30 gr. of potassium iodide three times a day until symptoms of iodism appeared, and **Vaccines** prepared from a twenty-four-hour culture in doses of 20 to 100 million every second to fourth day, brought about improvement.

REFERENCES.—[1]*Presse méd.* 1921, Sept. 7, 713; [2]*Ind. Med. Gaz.* 1921, Dec., 445.

## BURSITIS, SUBSARTORIAL. (*See* POSTURAL SUBSARTORIAL BURSITIS.)

## CÆSAREAN SECTION. *W. E. Fothergill, M.D.*

INDICATIONS.—J. M. Munro Kerr[1] utters a word of caution against unduly extending the use of Cæsarean section in cases in which it is not absolutely indicated. In these discretion must be exercised; for the operation leaves a uterus permanently injured and liable to rupture should another pregnancy occur. Until we can secure an absolutely sound cicatrix, the operation cannot be extended as far as many operators appear to desire.

*Contracted Pelvis* constantly affords absolute indications for Cæsarean section. Pubiotomy in certain cases may be used instead of it when forceps delivery has been attempted; it is more suitable for cases of contracted outlet than of contracted brim. Induction of labour does not compete with Cæsarean section, as it is only suitable for women in whom the accoucheur has previously had difficulty in forceps extraction, and feels that with a rather smaller child delivery would be facilitated.

*Tumours* such as fibroids obstructing labour give an absolute indication for Cæsarean section. Ovarian cystomata can generally be removed during pregnancy. In exceptional cases when this cannot be done and when obstruction is caused, Cæsarean section is required.

*Eclampsia.*—In 195 cases, 62 maternal deaths were recorded, a mortality of 31 per cent. No doubt this would be lower if the operation were performed earlier, but its use should not be extended widely for this indication. When the pregnancy is well advanced, but with no dilatation of the cervix or attempt at labour, and when, after six hours, there is no improvement from blood-letting, intravenous saline infusion, and morphine, Cæsarean section done without further delay would probably secure good results.

*Placenta Prævia.*—This was given as an indication by Lawson Tait so long ago as 1898, the suggestion being ridiculed by obstetricians. The fœtal mortality, however, is about 40 per cent, and the maternal 4 to 10 per cent, with ordinary methods of treatment. In 131 cases treated by Cæsarean section the maternal mortality was 10 and the fœtal 15 per cent. If the operation were done early for the primagravida with central placenta prævia, many mothers and children would be saved. In lateral placenta prævia it is not required.

*Accidental Hæmorrhage.*—In this condition the life of the child need not be considered: it can practically never be saved. Thus Cæsarean section cannot be urged for the sake of the child. In most cases the mother can be saved by obstetric methods; but a certain number remain in which Cæsarean section is the only course open, and in which it may have to be followed by hysterectomy. The mortality is 20 per cent for concealed accidental hæmorrhage treated by Cæsarean section.

*Ventral Fixed Uterus.*—This condition has in several cases given a proper indication for the operation, which has been avoided, however, in at least one case by separating the adhesions and allowing parturition to continue by the natural passage.

*Interposition* invariably causes severe dystocia. The fact that it has rendered necessary Cæsarean section should prevent its use in women who have not reached the menopause. [It is quite an unnecessary operation in any case.—W. E. F.]

*Prolapse of the Cord* has been treated by Cæsarean section, and this may be done with propriety if the patient is an elderly primipara and the cervix is rigid.

*Impacted Shoulder Presentation* is surely a bad indication in most cases, as if the time has passed for version the child's condition is generally far from satisfactory. In four cases there were two fœtal and two maternal deaths.

*Abnormal Conditions in Child.*—In special circumstances Cæsarean section has no doubt been justified in cases of a large child and of some malpresentations. Its choice seems hardly justifiable in hydrocephalus, hydramnios, varicose veins, and fœtal distress due to various causes.

*Retraction and Contraction Rings.*—There are a number of cases on record in which the so-called contraction ring has actually prevented the descent of the head. Probably many cases of this kind will be treated by Cæsarean section in the future.

*Rigidity of Vagina and Cervix.*—It is probable that too much patience is displayed in the treatment of these conditions. It is very difficult to predict the course of labour. If labours could be watched in nursing homes or hospitals, no doubt many tragedies could be averted by the judicious use of Cæsarean section.

*Grave Diseases Threatening the Life of the Mother.*—Cases under this heading gave a maternal and fœtal mortality of 20 per cent.

Munro Kerr concludes that in most instances there are alternatives, and the wise obstetrician is he who is not prejudiced in favour of a special procedure, but decides his line of action early: as vacillation in obstetric practice is fatal. He is convinced that twenty years hence the indications for Cæsarean section will have been extended even beyond the limits now suggested.

Eardley Holland[1] discusses methods of performing Cæsarean section. The technique of the **'Classical' Operation** has been standardized for the past forty years. In 1882, Spiegelberg estimated the mortality at 50 per cent. Routh collected the results of the operation in the United Kingdom down to 1910. The mortality in these cases was 3·6 per cent for those not in labour; 2·2 per cent in labour, membranes intact; 10·8 per cent in labour, membranes ruptured; 34·3 per cent frequent examinations or attempts at delivery. Eardley Holland and Munro Kerr collected British cases for the years 1911–20, and received details of about 4000 Cæsareans done during the last ten years, for pelvic contraction, in 3374 cases. The mortality was 1·6 per cent for cases not in labour; 1·8 per cent early in labour; 10 per cent late in labour; 14 per cent after induction of labour; 27 per cent after attempts at delivery by forceps or craniotomy.

*Defects of the Classical Operation.*—Holland enumerates these as: (1) Risk of sepsis in infected or suspected cases; (2) Risk of rupture of uterine scar in subsequent pregnancy or labour; (3) The rare one of intestinal complications due to adhesions; (4) Risk of adhesions which cause trouble at subsequent operations.

**The Lower Segment or Cervical Operation.**—In order to avoid the above defects, various new operations have been devised which can be grouped together under the above title. In the simple transperitoneal operation, for which the Trendelenburg position is used, the uterovesical peritoneum is incised and the bladder is separated from the uterine wall, exposing the lower uterine segment. This is then incised either longitudinally or transversely. After the extraction of the fœtus, placenta, and membranes, the uterine wall is repaired either by interrupted or continuous suture, a separate layer of suture being used for the thick uterovesical cellular tissue or fascia. Holland has used this technique, and claims for it certain advantages: (1) The wound lies in a quiet part of the uterus, and its edges are not drawn apart during healing; (2) The uterine incision is through a less vascular area; (3) The edges of the wound are thin, and are therefore easily and quickly stitched; (4) The position of the wound is such that adhesions to intestine, omentum, and abdominal wall cannot occur; (5) The wound is covered by a thick layer of fascia and by the bladder; (6) The intestines are not seen or disturbed during the operation; (7) The scar is in a safer area; (8) The operation is just as easy as the 'classical' one, and the more advanced the labour the easier it becomes. Thus the operation is most strongly recommended for patients who have been long in labour, when it is easier to perform and when infection of the wound is to be feared.

J. O. Polak[2] considers that surgical intervention is being too freely employed to terminate labour. He advocates aseptic intelligent expectancy in midwifery, and indicates that even in the hands of experts the maternal risk from Cæsarean section is greater than is generally known. This paper is one of several published recently with the object of counterbalancing the various essays in meddlesome midwifery that have become common and include certain unwise extensions of the indications for Cæsarean section.

Walthard[3] reports on 205 cases of cervical Cæsarean section with febrile convalescence in 27 cases. Symptoms during labour indicated that there was infection of the fœtal membranes previous to operation. The writer appeals to practitioners to teach their patients the prophylaxis of endogenous infection. This includes four measures to be used during the last eight weeks of pregnancy, namely, refraining from sexual intercourse, from vaginal douches, from the use of a public water-closet, and from public baths and from full baths at home. The woman should take only sponge baths, and not sit or lie in the water. [This reminds us of a popular belief in bucolic circles that if a female animal of the bovine race walks or stands in a pond, lake, or river beyond a certain depth, she will "take water in behind", with disastrous results.—W. E. F.]

REFERENCES.—[1]*Jour. Obst. and Gynæcol. Brit. Emp.* 1921, xxviii, Nos. 3 and 4, 338 and 349; [2]*Surg. Gynecol. and Obst.* 1922, May, 566; [3]*Schweiz. med. Woch.* 1922, lii, No. 7.

## CALCULUS, VESICAL. (*See* BLADDER; KIDNEY.)

## CANCER AND ITS PREVENTION.

*Joseph Priestley, B.A., M.D., D.P.H.*

Allowing for the more precise diagnosis of to-day, there is no reasonable doubt as to cancer being on the increase. Statistics show this: 26,325 deaths (uncorrected) from cancer in England and Wales during 1899 became 34,053 during 1909, and 42,144 during 1919; while in London the total deaths from the same disease (corrected deaths) have risen from 4858 during 1911 to 5463 during 1919—civilian deaths alone being included since 1915. Age-periods of life are not equally affected. Women are more subject to cancer than men (owing to the special organs of the former that are so liable to attack). Over the age of 40 years, 1 in 8 females and 1 in 14 males die from certified cancer—a difference that is made up by the greater frequency of the disease in the breast and uterus as compared with other human organs. It is definitely an adult's disease. In the early stages, cancer is curable, but in the later stages practically incurable (with a death-rate of 90 per cent).

It may be only a coincidence, but the disease appears to increase proportionately with civilization—especially *white* civilization. Some very primitive tribes are stated to be actually free from invasion by the disease.

Is cancer contagious? It may or it may not be. There is no evidence at present, though, by analogy with certain other diseases, it may be that the disease is a germ disease. Cancer houses and cancer districts are reported from time to time, but do not bear investigation. Is cancer hereditary? The tendency to the disease *may* be. Is it a 'deficiency' disease? Perhaps; and, if so, wherein lies the deficiency? Such questions and answers show how little is at present scientifically known about cancer. It is deemed advisable by some local authorities to issue pamphlets, dealing with preventive measures (on broad and general lines), and pointing out the value of early operative treatment—practically the only *cure* as at present known, with radium and *x* rays as valuable auxiliary methods of treatment, but only in certain cases of the disease (superficial cancer). There is something to be said in favour of the issuing of such official pamphlets, but there is also something to be said against the practice; for, by doing so, a scare may be created and more harm done than good. If anything definite were known as to the nature and causes of the disease, the public ought to know officially; but, in the absence of present-day definite knowledge, it is, perhaps, better to hold such pamphlets back—from the general public at least.

Quack medicines are a danger, though much is being heard of the so-called katassium remedy—the assumption being that cancer is a 'deficiency' disease, due to the absence, or a scarcity, of potassium salts in the diet. The late Dr. F. W. Forbes Ross was definitely of opinion that the disturbance of the potassium balance in the body is the cause, or one of the main causes, of epithelial cancer. He *may* be right.

## CAPILLARY PULSATION.

*Drs. C. Lian and Périsson.*

(*Translated by Carey F. Coombs, M.D., F.R.C.P.*)

Since Quincke, in 1868, first drew attention to the capillary pulse, all clinicians have been interested in it; but it is only recently, since the introduction of capillaroscopy, that the manner in which it is produced has been seriously discussed. This new method has made possible the observation that in persons with a capillary pulse there is no real intermission in the current of blood through the capillaries, and, moreover, not the least lateral displacement of the capillary walls with systole.[1] The so-called 'capillary pulse' is therefore due to exaggerated pulsation of arteries, and possibly also of veins, in the subpapillary plexus of the skin, and not of capillaries at all. It would be more consistent to abandon the term 'capillary pulse' in favour of 'systolic blush'.

REFERENCE.—[1]Boas, *Arch. of Internal Med.* 1922, June 1, 763.

## CARDIOSPASM. (*See* ŒSOPHAGUS, DISEASES OF.)

## CAROTID BODY, TUMOUR OF.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Geoffrey Keynes[1] reports a case of tumour of the carotid body. The patient was a married woman, age 31. She had a solid tumour of very hard consistency, lying deep to the left sternomastoid muscle from the angle of the jaw to the cricoid cartilage; no glandular involvement could be felt. The tumour was exposed and found to be encapsulated. It was easily freed, except from the carotid vessels which completely surrounded the tumour. Keynes states that of 60 recorded cases of carotid body tumour, all three carotid vessels were ligatured in 32 cases. Hemiplegia and aphasia followed in four, and two died from cerebral anæmia. Removal of the tumour in the case under review was postponed for a week until the nature of the operation was explained to the patient. It was then removed after ligature of the common carotid, of the internal carotid, and of the branches of the external carotid. There was an uneventful recovery.

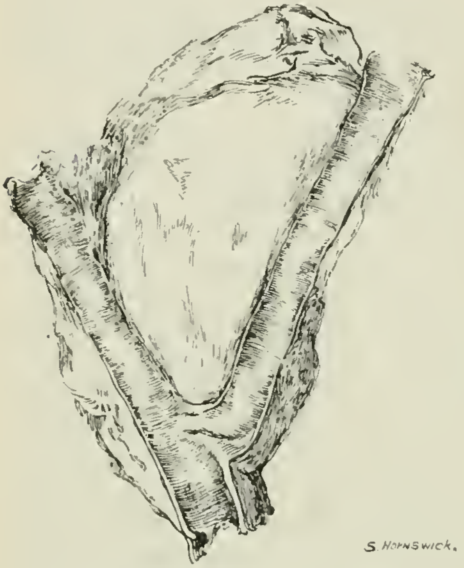

*Fig.* 29.—Tumour of the carotid body. Mesial section (*natural size*).
(*From the 'British Journal of Surgery'.*)

Pathologically, the growth was of an innocent endothelial type, and conformed in position and structure to the accepted description of tumours arising from the carotid body (*Fig.* 29).

In many of the recorded cases the growths were definitely malignant, but there is some evidence to show that they were innocent in their early stages. Recurrence followed in most of the cases in which an attempt was made to dissect the tumour away from the carotid vessels. The history of this case encourages the belief that a carotid-body tumour, if diagnosed early enough, may be successfully treated by complete removal, with ligature of all the carotid vessels.

Reference.—[1]*Brit. Jour. Surg.* 1921, July, 159.

## CATARACT.

*Lieut.-Col. A. E. J. Lister, I.M.S.*

Etiology.—H. Kirkpatrick,[1] in a paper discussing the etiology of cataract, concludes: (1) That the cause of primary cataract is probably constitutional; (2) That the morbid conditions which are associated with primary cataract injuriously affect the action of the endocrine glands; (3) That primary cataracts sometimes follow thyroid and parathyroid deficiencies, and are then almost certainly caused by a disturbance of endocrine function; and (4) That exposure to injurious light and heat rays, and the existence of an uncorrected error of refraction, are likely to determine the formation of a cataract in the eye of a person who is predisposed to a degenerative change in the lens fibres by a constitutional defect.

Treatment.—

*Cataract Operations on the Aged.*—S. G. Higgins[2] has a useful paper on this subject. He regards people of 80 and over as old. Writing of *diabetes*, he says that attention to the condition is of doubtful value. It is better to ascertain the probability of acute exacerbations and effects of other operative procedures than to worry oneself over possible complications. He says that a nervous operator will excite reactions on the part of the patient. He likes having one or two trusty relatives within call, and letting the patient know they are there. He does not disturb the dressing or inspect the eye before the third, fourth, or fifth day. [The practitioner can help the operator very much in a case of diabetes, as he knows the history of the patient. The reviewer has operated on a large number of cataracts in patients with diabetes, one being an Indian doctor, who had himself operated on ten thousand cases of cataract. He believes that the general practitioner should study the case beforehand, and hand over the patient to the surgeon in as good a state as possible, on a diet on which the patient feels comfortable and contented, and the operation should be done without further delay. He does not believe in a change of diet immediately before operation. It often makes the patient irritable and uncomfortable. He is apt to be restless, and is not as likely to do well as one who is passing a higher amount of sugar, but who is on a diet he is accustomed to and on which he feels comfortable.—A. E. J. L.]

*Extraction of Immature Cataract.*—Homer E. Smith[3] condemns intracapsular extraction, chiefly, it would appear, on the experience of others. He advocates his own operation, the essential feature of which is to open the capsule of the lens, and to allow the aqueous to act on the lens fibres. After six hours the lens is removed in the ordinary way and the anterior chamber irrigated.

*Iritis after Cataract.*—H. Smith[4] believes iritis after cataract extraction is due merely to capsule and not at all to lens matter, as in a case of his own in which lens matter was left in the wound through premature rupture of the capsule: iritis did not develop following the complete removal of the capsule. A skilled operator should not have more than 7 per cent of escape of vitreous by the Smith method. As in other surgical procedures, daily dressings are meddlesome.

*Medical Treatment of Cataract.*—Genet[5] queries whether any medical treatment is of use in arresting the tendency to cataract. To date, no local measures have proved certainly effectual, but they deserve more thorough trials, especially serotherapy with a **Phacolytic Serum** obtained by repeated injection of animals with an extract of fresh crystalline lenses. No one has ever seen a ripe cataract retrogress under **Potassium Iodide,** but certain writers have reported an arrest in the progress of the cataract, and some even a clearing up of the lens under it. Genet himself has never observed this ; but he has been impressed with the difference in the time required for ripening of the cataract in certain cases, regardless of whether medicine is taken or not. He warns that quacks pretend to cure cataract by using atropine, which materially increases the visual acuity while its effect lasts.

References.—[1]*Brit. Jour. Ophthalmol.* 1922, July, 279 ; [2]*Amer. Jour. Ophthalmol.* 1921, Dec., 911 ; [3]*N.Y. Med. Jour.* 1921, Oct., 462 ; [4]*Arch. of Ophthalmol.* 1921, 515 ; [5]*Médecine,* Paris (abst. *Jour. Amer. Med. Assoc.* 1922, March, 848).

## CEREBROSPINAL FEVER.

*J. D. Rolleston, M.D.*

Symptoms and Complications.—According to P. H. Kramer,[1] meningococcus infection may give rise to two different conditions, viz., (1) Infection of the mucous membranes of the nose and throat without any clinical symptoms ; (2) Septicæmia. In most cases meningitis develops so rapidly that it is difficult to determine whether it has been preceded by septicæmia. It is much commoner for definite signs of septicæmia, such as purpura, endocarditis, pericarditis, arthritis, etc., to occur during the course of epidemic meningitis. Numerous cases of meningococcus septicæmia without any symptoms of meningeal involvement have been recorded ; but it is very unusual to meet with septicæmia of several weeks' duration which finally terminates in meningitis, as in a case recorded by Kramer. His patient was a young man, age 19, who developed meningitis after six weeks' illness, the septicæmic nature of which was shown by continued fever, recurrent arthritis, and purpura. Recovery took place under treatment by lumbar puncture only, without the use of serum.

L. Caussade and A. Rémy[2] state that *infection of the cerebral ventricles* is a frequent cause of the failure of specific treatment in cerebrospinal fever. In children it can be detected by definite signs and symptoms, instead of being latent as in the adult, and is more amenable to treatment. The development of hydrocephalus, which is invisible in the adult owing to the rigidity of the skull, is shown in the infant by progressive increase in size of the cranium, widening of the fontanelles, separation of the sutures, softening of the skull bones, sinking in of the eyeballs, and the development of a rich venous circulation on the scalp. The anterior fontanelle is in a condition of permanent tension, and does not subside even when fluid is withdrawn by lumbar puncture, and all pulsation in it ceases. The only effectual treatment in such cases is **Ventricular Puncture** and injection of **Serum** into each ventricle alternately, every other day. When possible, cerebrospinal lavage with antimeningococcal serum should be performed.

According to P. Nobécourt and J. Paraf,[3] *cerebral abscess* is a rare complication of cerebrospinal fever. Though liable to occur at any age, it is most frequent in adults. In the writers' case, which occurred in a six-months-old infant, its existence was not suspected during life, and it was not discovered until the autopsy. Another case of meningococcal cerebral abscess is reported by Thouvenet and Dutheilhet de Lamothe.[4] The patient, a man, age 28, who had been discharged from the army for chronic otorrhœa and vertigo, suddenly developed symptoms of meningitis. Purulent fluid containing meningococci was obtained by lumbar puncture. A mastoid operation was performed, the lateral sinus and dura were exposed, and a large abscess in the right temporal lobe containing extraordinarily fœtid pus mingled with fragments of cerebral substance was evacuated. The abscess cavity was plugged with dressings soaked with antimeningococcal serum, and during the following days intrathecal injections of the serum were given. Complete recovery took place. The writers conclude that in cases of cerebral abscess it is the practitioner's duty to take smears and cultures of the pus removed at the time of the operation.

According to Bonnamour,[5] *purpura* may occur at all stages of cerebrospinal fever. It most frequently appears between the second and fifth day of disease, but it may precede the meningitis or be almost the only symptom of cerebrospinal fever, the existence of which is not recognized until the autopsy. In rare cases purpura may occur without any meningeal localization, in association with septicæmic manifestations such as arthritis, fever, and constitutional disturbance.

Huebschmann[6] describes the first case on record of *acute glomerular nephritis* due to meningococcal infection. The patient was a young man of 18 who died of cerebrospinal fever after two days' illness, and post mortem presented glomerular nephritis in addition to purulent cerebrospinal meningitis.

Diagnosis.—K. D. Blackfan[7] emphasizes the fact that cases of cerebrospinal fever do occur in which meningococci cannot be demonstrated in spite of persistent search in the cerebrospinal fluid removed from the ventricles or lumbar arachnoid space at different times. In a series of 202 cases of meningococcus meningitis which Blackfan had seen, there were 13 in which meningococci were not found in smear or culture. Corroborative evidence of meningococcus infection in such cases may be had by demonstrating the organism in the nasopharynx.

Treatment.—In continuation of his studies on the treatment of cerebrospinal fever (*see* Medical Annual, 1921, p. 105), K. Lewkowicz[8] maintains that the most effectual way to introduce the specific serum, especially when there is evidence of stenosis in the ventricle, is to make the injection directly into the lower part of the lateral ventricle. The needle is inserted transversely in the skull on a line joining the parietal eminence with the external auditory meatus, opposite the tip of the ear, or 1 to 4 mm. above it, so as to avoid the motor zone.

Commenting on Lewkowicz's contention that all cases of cerebrospinal fever should be treated by the early intraventricular injection of serum, Blackfan[7] admits that this would be the procedure of choice if it were definitely established that the organism gained entrance to the meninges by way of the ventricles. The weight of evidence, however, in experimental meningitis is against this view. Although the intraventricular injection of serum is indicated in small infants and in patients with a thick plastic exudate, the early injection of serum into the ventricles in the average uncomplicated case is not necessary.

A. Graeme Mitchell and J. J. Reilly[9] report the first case of subarachnoid block due to the meningococcus which has been cured by **Cistern Puncture.** The operation was performed on five occasions, and on the first four 5 to 8 c.c. of antimeningococcal serum were injected. The technique is as follows: The patient is placed on his side as for lumbar puncture, with the neck moderately flexed. After antiseptic preparation of the skin, and local anæsthesia with procain, the left thumb is placed on the spine of the axis, and the needle inserted in the mid-line just above the thumb, rapidly pushed through the skin, and then cautiously pushed forward and upward in line with the external auditory meatus and glabella until the dura is reached. The advantages claimed for cistern puncture are as follows: (1) It is a harmless procedure if carefully carried out; (2) The serum is brought directly in contact with the most infected portion of the subarachnoid space without the necessity of traversing the spinal canal or passing from the ventricles through the foramina and thence into the cisterna.

During the last five years E. A. Sharp[10] has treated 30 cases of meningococcus meningitis by **Intraspinal Injection of Oxygen** after lumbar puncture. Although only severe and apparently unfavourable cases were treated by this method, only 7 died—a mortality of 23 per cent—which contrasts favourably with that of cases treated by antimeningococcal serum alone. The oxygen appears to have little if any effect in destroying the organisms, its action being very largely mechanical in displacing the fluid and opening up secluded pockets of adhesions.

References.—[1]*Nederl. Tijds. v. Geneesk.* 1922, i, 293; [2]*Med. Science,* 1922, vi, 101; [3]*Ibid.*; [4]*Rev. de Laryngol. d'Otol. et de Rhinol.* 1922, 242; [5]*Med. Science,* 1922, vi, 104; [6]*Ibid.*; [7]*Medicine,* 1922, 139; [8]*Arch. de Méd. des Enf.* 1921, 407; [9]*Amer. Jour. Med. Sci.* 1922, ii, 66; [10]*Med. Science,* 1922, vi, 105.

## CEREBROSPINAL FLUID.

*J. Ramsay Hunt, M.D.*

*Froin's Syndrome.*—Among the many changes which the cerebrospinal fluid may undergo, certainly the most striking to the clinical observer is a yellow coloration associated with the formation in the fluid, soon after it is received into a test-tube, of a coagulum, which may be so firm as to allow of the tube being turned upside down without a drop of fluid escaping. This combination of appearances was described first by Froin in 1903, and in French literature has since gone under the name of 'syndrome de coagulation massive et de xanthochromie', or 'syndrome de Froin'. The rarity of appearance of this syndrome, the various nature of the cases in which it has been found, and the occurrence of all gradations of change from normal fluids to those presenting the typical syndrome, have combined to confuse our knowledge of its etiology and significance. J. G. Greenfield[1] analyses his experience with this syndrome, and reports the findings in 21 cases.

| No. | Nature of case | Cerebrospinal Fluid | | | |
|---|---|---|---|---|---|
| | | Colour | Fibrin | Albumin per cent | Cells |
| 1 | Paget's disease of the spine | Yellow | Solid clot | ? | None |
| 2 | Carcinoma of spine | Yellow | Solid clot | 1·2 | A few lymphocytes |
| 3 | Intradural myxoma | Yellow | Solid clot | 0·75 | None |
| 4 | Acute myelitis | Lemon-yellow | No coagulum, but fibrin present | 0·6 | None |
| 5 | Staphylococcal meningitis | Dark greenish-yellow | No clot | 3·0 | 7 lymphocytes per c.mm. |
| 6 | Cerebrospinal syphilis | Yellow | Heavy coagulum | 1·9 | 5 to 10 per c.mm. |
| 7 | Thoracic aneurysm | Yellowish | No coagulum | 0·5 to 1 | 15 large mononuclears per c.mm. |
| 8 | Pott's disease and tuberculous meningitis | Yellow | No coagulum | 0·5 (Albumoses present) | 1 per c.mm. |
| 9 | Pott's disease and paraplegia | Yellow | Fibrin web after addition of a drop of blood | 1·5 | None |
| 10 | Pott's disease and paraplegia | Lemon-yellow | No coagulum | 0·8 | 1 per c.mm. |
| 11 | ? Recurrence of spinal tumour | (1) Yellow | Heavy coagulum | 2·3 | None |
| | | (2) Yellow | No coagulum | 3·6 | Many mononuclear cells |
| 12 | Neurofibromatosis of cauda equina | Golden-yellow | No clot. Fibrin present | 1·5 | 9 per c.mm. |
| 13 | Endothelioma of cord | Slightly yellow | No clot | 1·5 | 4 per c.mm. |
| 14 | Intramedullary tumour of cord | Yellow | Heavy coagulum | 1·0 | 2 per c.mm. |
| 15 | ? Granuloma of spine | Pale lemon-yellow | Thin web after a drop of blood | 1·0 | 4 per c.mm. |
| 16 | Intramedullary sarcoma of cord | Yellow | No clot. Fibrin present | 0·75 | 6 per c.mm. |
| 17 | Intramedullary tumour of cord | Yellow | No fibrin | 0·3 | 4 per c.mm. |
| 18 | Intradural hæmangioma | Very slightly yellow | No coagulum | 0·15 | None |
| 19 | Perivascular sarcoma of the conus medullaris | (1) Slightly yellow | No coagulum. Fibrin present | 0·08 | 3 per c.mm. |
| | | (2) Colourless. | No fibrin | 0·04 | None |
| 20 | Peripheral neuritis | (1) Slightly yellow | Thick web of coagulum | 0·25 | 2 per c.mm. |
| | | (2) Slightly yellow | Thick web of coagulum | 0·35 | 1 per c.mm. |
| 21 | Peripheral neuritis | (1) Slightly yellow | No fibrin | 0·24 | None |
| | | (2) Slightly yellow | No fibrin | 0·16 | None |

He concludes that the syndrome of Froin consists essentially in the approximation of the character of the fluid obtained by lumbar puncture to that of blood-plasma. This approximation is never so complete as to render it identical. This change takes place characteristically when the fluid in the lumbar cul-de-sac is completely cut off from communication with the fluid in the ventricles and cisterna magna. This may be produced by tumours or other disease in the bones of the spine, by tumours of the meninges or cord, or by inflammatory adhesions in the pia-arachnoid membranes. The degree of change in the fluid depends more on the completeness of this block than on the nature of the blocking process ; but certain constituents of the fluid may vary in relation to the nature of the obstruction. The production of the syndrome is aided by venous congestion below the level of a compression, or by inflammation in the meninges and cord below an area of meningeal adhesion. It is not necessary to postulate any obstruction of the perineural or perivascular lymphatics. The lymph which reaches the subarachnoid space along them aids in the production of the syndrome. Acute peripheral neuritis may in fact itself produce an analogous condition in the cerebrospinal fluid.

*Cistern Punctures.*—In the serological work at Butler Hospital, puncture of the cisterna magna as a therapeutic measure was begun in 1920. McCusker[2] has used this procedure on nine patients, a total of fifty-five times. The technique is the same as that described by Ayer, of Boston. These punctures brought out some interesting observations. In the series there was no evidence of injury to the medulla, no death, and no blood in the spinal fluid, due to the fact that the technique was rigidly followed, and the needle was never introduced beyond 5 cm. There were no complications, the punctures were made without difficulty, and the discomforts to the patients were less than those usually found after lumbar puncture.

Although many of the patients were active, there was no sudden extension of the head, and hence the danger of breaking the needle was less than in lumbar puncture. The nuchal area was found less sensitive than the lumbar region. There was consistent absence of pain on piercing the dura, for which he can give no explanation. There was no puncture headache or any serum reaction—an important observation when the only after-care was rest for from two to four hours. In no case was the patient's fear of discomfort sufficient to make him rebellious against this treatment. The introduction of the needle into the cistern never caused a root-pain, because there are no nerve trunks to hit at a depth of 4 to 5 cm. There were no medullary signs, like slowing of the pulse or changes in respiration, on introducing the serum into the cistern. There were no nuchal aches following cistern puncture, in contrast with the stiffness and pains in the back from which patients often suffered after lumbar puncture. In lumbar punctures on a restless patient, an assistant must prevent the patient from straightening his spine ; in these cistern punctures the operator controlled the patient's flexed head by holding it with his proximal hand during the operation.

*Sugar Content.*—R. Coope[3] has investigated the sugar content of the cerebrospinal fluid and its diagnostic value, especially in encephalitis lethargica. The general opinion of workers in this field appears to be that the sugar content of the cerebrospinal fluid varies with that of the blood, though the variations are not so great as those of the blood. Two definite points emerge from a study of the subject. In the first place, a 'high' sugar content should not be regarded as a positive diagnostic sign of encephalitis lethargica ; in the second place, a low sugar content (provided the fluid is fresh) is a very strong indication of an acute or tuberculous meningitis.

The author's results and conclusions, based on a series of 95 cerebrospinal fluids, confirm the above conclusions. The sugar content (in mgrm. per 100 c.c.) obtained in the various cases is given in the following table.

Sugar Content in 95 Cerebrospinal Fluids (Mgrm. per 100 c.c.).

Encephalitis lethargica, 85, 94, 68, 83, 67, 91, 69, 54, 80, 54, 72
Tuberculous meningitis, 40, 29, 55, 24, 24, 23, 25, 26, 36, 14, (59), 22, 18
Pneumococcal meningitis, 19
Meningococcal meningitis, 8

*Other diseases* :—
Uræmia, 87
Pneumonia (without meningitis), 63
Hydrocephalus, 63
Syphilitic meningitis, 100, 91, 80, 72
Tabes, 61, 54, 78, 72
General paralysis of the insane, 102, 62, 78, 48, 44, 54, 63, 67, 50
Mania, 87, 85, 83
Epileptic insanity, 78, 72, 72, 78
Imbecility, 111
Dementia præcox, 74, 63, 56, 78, 72, 81, 74, 73, 72, 67, 68, 74, 61, 61, 63
Delusional insanities, 73, 77, 80, 72, 89, 73, 66, 68, 66, 61, 74, 81, 74, 51, 43, 63, 63
Paranoid dementia, 91
Disseminated sclerosis, 61
Cerebellar atrophy, 65
Cases not diagnosed, 50, 63
'Normals', 64, 69, 83

His own observations thus confirm the conclusions drawn from a survey of the literature, and show that it is extremely probable that the 'normal' figure of Mestrezat is too low. At all events, the sugar content usually met with in most cerebrospinal fluids obtained for diagnostic purposes, when estimated by a reliable method, lies between 60 and 80 mgrm. per 100 c.c., thus agreeing with both von Jaksch's and Hopkins' figures for 'normals'. On the other hand, a low sugar content, especially one below 40 mgrm. per 100 c.c., is strongly in favour of a meningitis whose causal agent is some organism that can consume or destroy sugar—provided, of course, that the specimen is not contaminated or stale. In this connection a sugar estimation may be of great value in differentiating particularly between encephalitis lethargica and tuberculous meningitis—a differentiation which clinically is not always easy in cases where the tubercle bacillus has not been found in the fluid.

References.—[1]*Jour. of Neurol. and Psychopathol.* 1921, Aug., 105; [2]*Jour. of Nerv. and Ment. Dis.* 1921, June, 453; [3]*Quart. Jour. Med.* 1921, Oct., 1.

## CERVICAL RIBS. (*See also* Aneurysm—Subclavian.)

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

It has been pointed out that supernumerary ribs are much more frequently found in the lumbar than in the cervical region, but there is not a single case on record in which the lumbar rib has caused any inconvenience.

Of the reported cases of cervical rib, the majority have been found in females. The condition is most often bilateral, with one supernumerary rib much larger than the other; the seventh cervical is the most frequently involved. The position of the rib much more than the size is responsible for the symptoms produced. Some prominence in the neck, with pressure on the blood-vessels or nerves producing symptoms and superficial pulsation in the subclavian artery, arouses suspicions as to the presence of a cervical rib. If present, it is usually palpable in the neck, and the diagnosis is then confirmed by *x*-ray photography.

When patients complain of rheumatism in the arm, or have been diagnosed as brachial neuritis, the possibility of cervical rib should be borne in mind, and the distribution of the ulnar nerve especially examined. Some observers state that there is inability to extend the arm fully at the elbow, and there may be hoarseness due to pressure of the recurrent laryngeal nerve; extreme circulatory disturbances may occur.

Colonna,[1] dealing with these points, comes to the following conclusions: The pressure on the nerves and blood-vessels inducing pain, or even paresis of the arm, makes the subject one of surgical interest. While the Röntgen ray has been the means of confirming many tentative diagnoses of the anomaly, a comparison of clinical and necropsy statistics shows that a large number escape detection. This is mainly because, as pointed out by Henderson, about 90 per cent of the cases are symptomless. Fischel in his necropsy findings reports the deformity in 1 per cent of cases, while Henderson says it was clinically recorded in only 31 of 80,000 patients examined at the Mayo Clinic. The wide range in the variety and degree of symptoms which the patients present makes the diagnosis especially difficult, the one almost pathognomonic sign being a pulsating mass above the clavicle, which Cabot states means cervical rib in nine cases out of ten. Conservative treatment in some cases has been of value, and apparently even a few cases have been cured by it; but, for the reasons stated, whenever signs of compression occur an operation is indicated.

[It must be remembered that, in the absence of cervical rib, compression neuritis may be due to the normal first dorsal rib. The reviewer has pointed out (*Practitioner*, June, 1920), that the symptoms in a general way are those of cervical rib. Pain along the ulnar border of the arm and forearm increased by anything producing depression of the shoulder girdle, atrophy and paresis of the intrinsic muscles of the hand with loss of sensibility for pinpricks, without any loss of the sensation of light touch : this is a dissociation which denotes nerve compression. Any condition which lowers the shoulder girdle, such as fractured clavicle, will predispose to compression by bringing the lower nerve trunk in more close relationship with the first rib. The majority of cases, however, occur in young adults without apparent cause.

In a case recorded to illustrate this condition, a statement of great interest was made by the patient. He stated that the gripping power of his fingers depended greatly upon the position of the arm. Above his head his power was increased, and he could write on a blackboard steadily and with ease. Gripping a teacup, on the other hand, was almost impossible. On giving him a pen and paper he wrote his name like a man suffering from paralysis agitans; but when the paper was put on the wall above his head, the writing was clear and steady. Removal of the first rib did not in this case tend to ultimate recovery.—W. I. de C. W.]

Bramwell and Dykes[2] discuss rib pressure and the brachial plexus. It is remarkable that the senior writer has records of 23 instances, which indicates that these cases are not uncommon. Four cases are given as examples.

*Case* 1 had complete bilateral cervical ribs, but no pressure symptoms.

*Case* 2 had unilateral pressure symptoms, but no cervical rib. The first dorsal rib was removed, and was followed by recovery. This patient was a typist who had been troubled for seven years with pain along the inner side of the left forearm, which had necessitated her giving up her occupation. There was some weakness of the left hand, some flattening of the thenar eminence, and tenderness on pressure in the region of the seventh cervical vertebra on the left side.

*Case* 3 had unilateral paresis of intrinsic muscles of the hand and flexors of fingers. Onset during an attack of diphtheria. Well-developed cervical rib. Possibility of an infective nature.

*Case* 4.—Slight symptoms of rib pressure. No cervical rib.

A fifth case illustrated typically the symptoms produced by pressure on the first dorsal nerve root against the sharp internal border of the first rib.

Todd[3] draws attention to the relationship between posture and the cervical rib syndrome, and, by experiments on himself, showed that the symptoms can be produced in the absence of anomalies at the cervico-thoracic junction.

REFERENCES.—[1] *Amer. Jour. Med. Sci.* 1922, Jan., 80; [2] *Edin. Med. Jour.* 1921, Aug., 65; [3] *Ann. of Surg.* 1922, Jan., 105.

## CHANCROID.

*Col. L. W. Harrison, D.S.O.*

F. Königsberger[1] found *Sp. pallidum* in 10 per cent of sores having the typical appearance of chancroid, and in 34 per cent of erosions and other lesions which had the appearances neither of chancroid nor of syphilitic chancre. The inference is that the discharge from all lesions of the genitals should be examined microscopically.

Lévy-Bing[2] recommends a 10 per cent ointment of '914' for the treatment of chancroids. Queyrat[3] recommends Pick and Jacobson's stain for Ducrey's bacillus as a local application for chancroid. The stain is **Ziehl's Fuchsin,** 35 c.c., with **Watery Methylene Blue,** 15 c.c. This is applied daily, and the sore washed with peroxide of hydrogen and soap every four days.

References.—[1]*Zeits. f. ärztl. Fortbild.* 1921, 18, 433 (ref. *Med. Science*, 1922, May) ; [2]Ref. *Med. Science*, 1922, May ; [3]*Bull. Soc. franç. de Dermatol. et de Syph.* 1921, 28, 288 (ref. *Med. Science*, 1922, May).

## CHEYNE-STOKES RESPIRATION.

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

*Pathogenesis of Cheyne-Stokes or Cyclic Respiration.*—Straub and Meier[1] discuss the possible explanations of the interesting pathological condition known as Cheyne-Stokes breathing. This condition has usually been referred to a reduction of irritability of the respiratory centre with reference to the natural respiratory stimulus. Haldane and his assistants, however, have called attention to disturbances in the chemical regulation of the respiratory apparatus.

The modern conception of the regulatory mechanism of respiration is to the effect that the respiratory centre is stimulated to activity by the hydrogen ion concentration of the fluid that laves the respiratory centre. Under this influence, the respiratory centre regulates the amount of ventilation of the lung so that the carbon dioxide tension of the alveolar air, and thus of the arterial blood, is preserved at a constant and characteristic value. The carbon dioxide content acts then as the quickly available regulator for the preservation of the uniform hydrogen ion concentration. The carbon dioxide plays much the same part as the fly-wheel of a steam engine. Haldane and Douglas were able to show that cyclic breathing occurs in a healthy subject when the respiratory regulation is no longer determined exclusively by the carbon dioxide ; when, namely, in addition to this, the shortage of oxygen begins to affect the situation materially. In a patient presenting cyclic respiration to a marked degree, Straub and Meier found that, in truth, the carbon dioxide tension of the alveolar air was permanently and materially reduced. When the inspirations, gradually increasing in depth, reached a maximum, the carbon dioxide tension measured 19 mm., and, at the end of the apnœa phase, 29 mm. The curve showing the combining function of the blood for carbon dioxide was normal in this patient. The $p_H$ of the arterial blood, owing to the low carbon dioxide tension, was changed to abnormal basic values ; it was 7·504 at the end of the period of apnœa and 7·63 when the breathing was deepest.

This observation shows that the respiratory disturbance was not occasioned by a deficiency of carbon dioxide in the blood as in renal insufficiency, nor by a general disturbance of the circulation as in cardiac insufficiency. It is also opposed to the assumption of a reduced irritability of the respiratory centre, and points to a lack of oxygen in the tissue fluid that laves the respiratory centre.

Reference.—[1]*Deut. med. Woch.* 1922, Jan. 12 (abstr. in *Jour. Amer. Med. Assoc* 1922, April 1).

## CHICKEN-POX.

*J. D. Rolleston, M.D.*

A. Sack[1] records a case of very severe chicken-pox in a child, age 6½ years, and attributes the severity of the attack to the patient having recently been treated with the quartz lamp, the ultra-violet rays of which had sensitized the skin and activated the eruptive process in an extraordinary degree. (*See also* MEDICAL ANNUAL, 1921, p. 506.)

Rocaz and Lartigaut[2] report the case of a child who, after a mild attack of varicella, developed *encephalitis*, which was manifested by choreo-athetotic movements in the left upper limb and some disturbance of gait. The cerebrospinal fluid was normal. (For other examples of nervous complications in varicella, *see* MEDICAL ANNUAL, 1915, p. 674.)

The relationship of chicken-pox to herpes zoster is still *sub judice*. A. Netter[3] is an enthusiastic advocate of the view that the two diseases are due to the same virus, and his son, H. Netter,[4] has collected 102 cases, in 87 of which zoster was followed by varicella, and 15 in which varicella was followed by zoster. J. Comby,[5] on the other hand, commenting on a case reported by Pignot and Durand in which a child developed chicken-pox thirteen days after its mother's zoster, maintains that there is no relationship between the two diseases. During the last forty years he has seen thousands of cases of chicken-pox and scores of cases of zoster without having noticed any coincidence between the two affections. (*See also* MEDICAL ANNUAL, 1919, p. 464; 1920, p. 386; 1921, p. 507; 1922, p. 87.)

REFERENCES.—[1]*Münch. med. Woch.* 1922, 591; [2]*Gaz. hebd. des Sci. méd. de Bordeaux*, 1921, 425; [3]*Bull. de l'Acad. de Méd.* 1922, i, 535; [4]*Thèses de Paris*, 1920–21, No. 429; [5]*Bull. Soc. méd. Hôp. de Paris*, 1922, 1002.

## CHILD WELFARE. (*See* MATERNITY AND CHILD WELFARE.)

## CHOLERA.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

PATHOLOGY AND ETIOLOGY.—F. P. Mackie and G. Trasler[1] record laboratory experiences of cholera in Mesopotamia, using the ordinary bacteriological methods. In many typical cases carbol-fuchsin-stained flakes from the stools allow of a correct immediate microscopical diagnosis of great help to the clinician. The use of McConkey's medium, allowing of the recognition of enteric and dysentery as well as of cholera vibrios, is advised in addition to Dieudonné's medium, while Arosen's medium containing saccharose and neutral red was also found of value. Spirochætes almost invariably accompanied the cholera vibrios. Only 8·2 per cent of cholera patients were found to be carriers more than ten days after an attack, and only two of some hundreds up to five and seven weeks respectively. In one suspected case a heavy infection of paratyphosus A was isolated. The possibility of infection through fruit and vegetables such as melons, cucumber, and tomatoes was investigated, and whole ones were found to be sterile; but artificially infected cut surfaces of melons retained the cholera vibrios alive for at least twenty-four hours, so that such cut surfaces exposed in the bazaar might possibly be infected by flies, and should be avoided.

C. A. Sprawson and J. G. Mukherji[2] report a choleroid epidemic in August, 1921, a month in which true cholera usually subsides with the monsoon, in which the cases were mild and the stools often atypical in retaining some yellow colour, and cholera vibrios were commonly absent. Bacteriological examinations in 60 stools showed similar organisms in 37 giving the cultural characters, but not the agglutination reactions, of paratyphosus B, and they were reported by the Kasauli laboratory to be a 'paratyphoid-B-like organism'.

Treatment.—L. M. Chatterjee[3] reports a mortality of only 20·5 per cent in 97 cholera cases, mostly severe, by **Rogers' Method** slightly modified by giving fractional doses of **Calomel** in the place of permanganate. In cases in which sudden vasomotor disturbances set in, preventing further saline being given, an injection of 1 c.c. **Pituitrin** was used with success.

References.—[1]*Ind. Med. Gaz.* 1922, 121 : [2]*Ibid.* 2 ; [3]*Ibid.* 10.

## CŒLIAC DISEASE.

*Frederick Langmead, M.D., F.R.C.P.*

The etiology of this disease, described as the 'cœliac affection' by Gee in 1888 and 'acholia' by Cheadle in 1903, remains obscure. Edmund Cautley[1] distinguishes between acholia and cœliac disease. Acholia may be simple in origin and temporary in duration ; it occurs in catarrhal jaundice, and not infrequently as a temporary incident in infancy. On the other hand, undernourished infants, fed on cows' milk, may pass white stools with excess of undigested curd, hiding the colour of much bile. The stools have neither the offensive odour due to absence of bile, nor the rancid odour from excess of fat. White stools do not necessarily denote acholia, for the bile may be in the form of colourless urobilinogen.

Treatment.—Cautley recommends that fats should be limited in the diet, and sometimes excluded. Since cows' milk is particularly unsuitable, recourse must be had to human or asses' milk, or a dried, malted, or condensed milk. Skimmed milk may be tried, but should be partially predigested by preparing it with Benger's food. He points out that the fat in yolk of egg agrees well in some children ; while others can take small quantities of butter, bacon fat, or dripping. Carbohydrates agree best in the form of malted or partly malted preparations—rusks, malted rusks, and biscuits are all suitable. Milk sugar, maltine, and honey are useful additions to the diet, if starches are not digested well. Sometimes potatoes agree well ; sometimes ground rice, semolina, and revalenta can be taken. For proteins he relies on good broths, and pounded fish, chicken or other white meat, and mutton or beef. Calves'-foot and sweet jellies may also be given. The diet must be regulated with nicety, and the amounts taken should be estimated carefully, and the stools examined daily.

He has not found **Bile-salts** or **Bile** of certain value, and doubts whether they are really beneficial. However, he advises their trial in all cases. They can be given in the form of **Glycocholate** and **Taurocholate of Soda,** of each 1 gr., with an alkali, syrup of orange, and water. **Ox-bile** in keratin-coated capsules may be given to older children. He finds **Bismuth and Soda** and **Aromatic Chalk Powder** useful for the looseness of the stools, and **Sulphocarbolates, Phenol,** or **Salol** for the offensive odour.

Reference.—[1]*Clinical Jour.* 1922, Jan. 18, 26.

## COLOSTOMY. (*See* Intestines, Surgery of.)

## CONGENITAL DISLOCATION OF HIP. (*See* Bones and Joints, Surgery of.)

## CONVULSIONS IN INFANTS.

*Frederick Langmead, M.D., F.R.C.P.*

John Thomson,[1] from his records of 4348 out-patient children under four years of age, finds that fits began during the first three months in only 3·5 per cent of cases, during the second six months in nearly 8 per cent, during the third six months in nearly 9 per cent, and during the later six-month periods in between 7·1 and 7·6 per cent. To convulsions in children of three months or less he directs particular attention. Their causes, he says, are numerous and of many kinds, and he divides them into three groups :—

*A.—Local Injury or Disease of the Brain or its Membranes*: (1) Birth injury (intracranial hæmorrhage, etc.); (2) Meningitis; (3) Hydrocephalus; (4) Other brain lesions (acquired or congenital); (5) Congenital idiocy from arrest of cerebral development (with petit mal).

*B.—Cerebral Disturbance due to Acute Disease of Organs other than the Brain*: (1) Food disorders; (2) Jaundice of various kinds; (3) Genito-urinary (infection of the urinary tract with *Bacillus coli*, etc.); (4) Bronchitis and bronchopneumonia; (5) Choroiditis, otitis, congenital heart disease; (6) Unknown causes.

*C.—Cerebral Disturbance connected with Various Forms of General Infection and of Debility*: (1) General tuberculosis; (2) Congenital syphilis; (3) Debility; (4) Whooping-cough; (5) 'Idiopathic convulsions'.

Taking these various causes seriatim, he deals first with *birth injuries*, the convulsions arising from which begin almost always within the first few days of life; 37 of his 200 cases of fits in children up to three months of age belonged to this group, and in more than three-fourths the fits began on the first, second, or third day, whilst only in 5 were they deferred beyond the first week. Boys were more often affected than girls. The diagnosis of the nature of the convulsions depends upon the character of the labour, on the date of the onset of the symptom, and on the child's condition at or soon after birth, especially on the occurrence of asphyxia with difficulty in getting respiration established. It is strongly confirmed if the fontanelle bulges soon after birth, or if fluid obtained by lumbar puncture is blood-stained. The prognosis in such cases is always serious, though many recover to a surprising degree. Even those who appear to make a satisfactory recovery are often found to have some degree of mental defect or instability, or a tendency to epileptic seizures later in childhood. Permanent rigidity of the limbs not infrequently develops. He doubts whether the early operation of removing the intracranial clot, recommended by Cushing and others, is often of permanent benefit.

Of the *convulsions due to congenital brain defect*, many are met with during the early months of life; 18 of Thomson's 200 cases belonged to this group, and 13 of them were in girls. Generally the attacks began insidiously, and their grave significance was often overlooked at first by the parents. The seizure usually consisted in a sudden momentary jerk forward of the head and shoulders, with the arms extended and somewhat abducted and pronated. The child loses consciousness for a few seconds, and on regaining it cries as if in pain. After the attacks have recurred for a year or two they are apt to be accompanied or replaced by regular epileptic seizures. Sometimes from the first the parents have noticed that the baby has not been normally bright. Always, as time goes on, it becomes less intelligent, the deterioration being more rapid when the fits are numerous, and slight improvement occurring during the earlier stages, when they are few or absent for any time. The child is late in holding up its head, and the cranium remains too small. He regards these fits as probably connected with arrested development of the brain-cells. The prognosis is extremely bad, all the children becoming idiotic, though they may live to adolescence or even to adult life. Bromides and chloral are rarely even of temporary advantage. Occasionally a tonic, or some regulation of the diet, or even a febrile illness may cause temporary improvement; this may also follow change of climate or more open air.

The largest group were those due to *digestive disturbances*, and comprised 46 cases. The treatment consists in regulation of the diet—the 'short cut' to recovery being the employment of a wet nurse.

Amongst the other types which he mentions it is interesting to find that in only 5 per cent of his cases could he ascribe the fits to *congenital syphilis*;

he thinks that syphilis in itself plays little part in the production of this symptom.

*Idiopathic Convulsions.*—Very valuable is Thomson's account of the idiopathic convulsions of early infancy, for which no central, reflex, or other cause has yet been discovered. They generally occur in the first week of life and are not very common, for in twenty-five years he has seen only 35 cases in very young babies and 2 in rather older infants. He thus describes a typical case: The patient, who is usually a boy, has been bottle-fed, and has hitherto seemed well in every respect. He has not suffered from any severe food disorder; there has been no reason to suspect cerebral birth injury, and his mental condition has been normal. When two or three weeks old he begins to have slight twitchings of the face and limbs which recur at frequent intervals. These soon develop into regular convulsive seizures of short duration. After they have gone on for a day or two, the fits become very numerous—20 to 50 in the day—and may continue so for weeks, if the case is not successfully treated. During the short seizures the child is unconscious, and between them is usually drowsy.

TREATMENT.—The administration of bromide, even in full doses, has little or no effect in stopping the attacks: but if **Chloral** is given cautiously and continuously in a sufficiently large amount, the fits not only cease rapidly, but do not return when the drug is discontinued; and the child grows up perfectly healthy in mind and body. There are reasons for suspecting that if the treatment is not carried out effectively the child's mental condition may be permanently damaged. He recommends that the chloral be administered by the mouth, beginning with doses of 1 gr. every two hours. If the fits continue, 1½ gr. must be given, and the dose may need to be increased to 2 gr. every two hours for a short time, in children more than a month old. This dose cannot, however, usually be given for more than a few hours, as it soon makes the child too drowsy to swallow. When the fits have ceased for a day or two days, the chloral should be given at increasing intervals—three, four, and six hours—and then by degrees stopped. In most cases the child gradually awakes, his appetite returns, and he has no more fits, though he sometimes remains more or less drowsy for weeks.

Of the 35 cases, 1 was lost sight of at once, 3 died rapidly of pneumonia, and 2 a month or two after apparently successful treatment; 2 became mentally defective. Of the remaining 27 cases, 15 recovered and were lost sight of after several months; of the 12 others, 2 died from acute infectious illness in later childhood; 10, whose ages vary from thirteen months to twenty-four years, have had no more fits, nor have they been subject to asthma or to severe indigestion, or shown any idiosyncrasy to articles of diet.

There are two dangers in the treatment—one, the risk of inhalation-pneumonia due to difficulty in swallowing milk while the child is drowsy; the other, mental deterioration when too little chloral is given, so that the child's vitality is depressed though its brain-cells are not safeguarded from injury by the toxins of the disease.

REFERENCE.—[1]*Brit. Med. Jour.* 1921, ii, 679.

## CORNEA, DISEASES OF.

*Lieut.-Col. A. E. J. Lister, I.M.S.*

*Corneal Ulcers.*—H. Gifford[1] has found that whilst **Tincture of Iodine** is useful as an application in corneal ulcers, particularly of the herpetic or dendritic variety, it is difficult to use effectively and carefully, as it evaporates so quickly. Unless the application is made with careless rapidity, the swab is apt to become so dry that it produces no effect. He puts 10 to 12 crystals of iodine into 10 or 15 drops of the ordinary tincture, and keeps it in a small bottle. This produces a syrupy liquid free from the objection mentioned, besides being more effective. Where a less concentrated tincture is desired, 5 per cent of glycerin may be added to the ordinary tincture. [These strike us as useful and practical suggestions, and they may be of service to practitioners wishing to use iodine as a local application in conditions other than ocular ones.—A. E. J. L.]

J. V. Patterson,[2] in opening a discussion on the treatment of corneal ulcers, pointed out that the main cause of the vulnerability of the cornea is its lack of blood-supply. *Ulcus serpens* or *hypopyon ulcer* should never be treated at home. It is not so much a matter of applying suitable remedies, as having them carefully applied and their effects watched. The tear passages should be carefully examined, and also the intra-ocular tension. The latter is often of great importance, especially in elderly patients. In the treatment of such cases one is often successful with the simplest régime: frequent **Neutral Saline** bathing, **Atropine** drops twice a day, and usually, in addition, a **Silver Salt** or **Argyrol, 20** per cent, thrice a day. The condition of the tear sac is always carefully investigated, and any tear-sac trouble treated. The eye is never covered with any sort of dressing or shade at this stage, but a little sterile vaseline is applied to the lid margins. In many early cases the eye gets well under this treatment. If at the end of twenty-four to forty-eight hours the ulcer is found to be progressing, it is touched with pure **Carbolic Acid:** the acid is applied on the sharpened end of a match, and is rubbed well into the spreading margin, where there is usually some undermining. If the spread of the ulcer looks severe and threatening, Patterson prefers to use the **Actual Cautery** at this stage.

For cases seen in a rather more advanced stage, if the ulcer does not look very active, one may with advantage wait twenty-four hours at least, and note if there is any spread. Some do well with argyrol and atropine; but if the ulcer appears to be very actively spreading, the actual cautery is the most certain and effective remedy. **Saemisch's Section** is a valuable method of treatment where the cautery has failed to check the spread of the ulcer. In Edinburgh it is customary to leave eyes uncovered until the ulcer is cleared and reinfection is hardly to be feared. A pressure bandage is then often useful, especially in cases of perforation with leakage from the anterior chamber.

In cases of ulcer with hypopyon in children the cautery or carbolic acid is not required. Nearly all such cases do well with proper treatment.

*Strumous Ulcers* are commoner than formerly. If the symptoms are acute, the children are kept in bed, given a simple purgative, and next day are put on small doses of **Grey Powder** or **Calomel.** In many cases the chief error of diet seems to be an excess of starchy foods, the mother giving the children sweets and sweet biscuits to keep them quiet. Locally **Atropine** is given, and Patterson believes it does a great deal of good.

When the condition has passed the very acute stage, the atropine is combined with **Yellow Oxide of Mercury** ointment, ½ to 1 per cent. Most cases do well on this treatment, but in obstinate cases **Tuberculin** is valuable. Tonsils, adenoids, and tuberculous glands often require treatment.

*Herpetic Ulcers of the Cornea* are best treated by the application of **Absolute Alcohol.** The alcohol is applied on cotton-wool wrapped round the edge of a match or probe, and should be applied, not only to the denuded area, but to any neighbouring epithelium loosened or diseased. A drop of atropine is then put in and a bandage applied. Very rapid recovery usually results from this treatment, even in cases which have lasted for weeks. *The dendriform type of herpetic ulcer* is treated similarly. Patterson has failed in several cases to check the spread of a *Mooren's ulcer* with any form of application, but in one case the application of alcohol achieved a rapid and lasting cure.

An interesting discussion followed the reading of the paper, from which we cull the following :—

N. B. B. Flemming has found **Magnesium Sulphate,** used first in Madras by Kirkpatrick, very useful. He employed a saturated solution in an eye-bath, and kept it in contact with the eye for five minutes every two to four hours. The action was osmotic and bactericidal, and was most efficient in chemotic conditions of both cornea and conjunctiva, such as large corneal ulcer or abscess, and in gonorrhœal ophthalmia in adults. The subconjunctival injection of 2 to 3 min. of **Colloidal Iodine** twice a week was a valuable method of treatment in severe marginal ulcers.

N. Bishop Harman has given up the use of the actual or electric cautery in hypopyon ulcers for some time. However delicately used, it appeared to him to extend the resultant scar, and he did not find it checked the spread of the ulcer better than less drastic measures. He advocated free **Irrigations,** the use of **Hydrogen Peroxide,** and **Leeching.** The caustic substance he found of most service was **Phenocamphor,** a mixture of pure carbolic acid and camphor : the two solids were placed in a bottle and liquefied each other. The liquid was very penetrating, a most efficient antiseptic, and singularly free from destructive effects. He applied it with a pointed match, stabbing the fluid into the edge of the ulcer, deep into the epithelium. Although he did not use the **Actual Cautery** for hypopyon ulcers, he did use it for the chronic vascular ulcers of children—the so-called strumous ulcers. If each of the vessels entering into such an ulcer was just touched by the point of the cautery, a short distance on the conjunctival side of the limbus, the effect of stoppage of the abnormal blood-supply was magical in its effects.

J. Hern, in the very chronic *ulcer of middle-aged people,* had had most encouraging results from **Stitching the Lids together** for fifteen days.

A. S. Percival always uses **Quinine** with the atropine drops, quin. hydrochlor. 8 gr. to the ounce of $\frac{1}{4}$ or $\frac{1}{2}$ per cent atrop. sulph. solution. In the simple case of a non-perforating ulcer with hypopyon (presumably sterile pus), he had found the hypopyon disappeared in two or three days. If the quinine were stopped and the atropine continued, the hypopyon reappeared ; on repeating the quinine, the hypopyon disappeared. He had done this three times in succession. For this reason he had always added the quinine drops, twice a week, after the disappearance of the hypopyon.

D. M. Mackay mentioned that he was in the habit of applying pure **Carbolic Acid** to hypopyon ulcers, and was not concerned if it ran over the healthy cornea, for he had found that no permanent marking remained, the scar being limited to the ulcer.

[Practitioners are often called on to treat corneal ulcers, and the methods of treatment actually used by experienced men are always of interest, however different they may be. The use of **Magnesium Sulphate** is recommended by other men of experience. Though the reviewer has not sufficient personal experience of it to express an opinion, it is so simple and easily carried out that it is worth a trial by those who have not used it, especially in a case that is not doing well by the ordinary method of treatment. The author, while believing in carbolizing ulcers of a severe type, has found that **Xeroform** dusted into the eye twice a day, as an adjunct to other treatment, is of great use. His experience of its value has been confirmed by others who have tried it.

In some cases of corneal ulcer, especially in those in which the conjunctiva is not very healthy-looking, painting the lids with two per cent **Silver Nitrate,** and at the same time touching the ulcer with it, has sometimes given excellent results, combined, of course, with other appropriate treatment. He has, however, seen good results, in some cases of ulcers of rather a chronic type, from touching the ulcer with 2 per cent silver nitrate, without touching the lids. It is applied by means of a little cotton-wool twisted round the end of a small glass rod. A probe or a match answers the purpose, if a glass rod is not available.—A. E. J. L.]

*The Influence of Trauma on the Onset of Interstitial Keratitis.*—T. H. Butler[3] mentions that J. F. Cunningham at the meeting of the Ophthalmological Society of the U.K. in May, 1922, stated that he found a history of trauma in 3 per cent of cases of interstitial keratitis. Mr. Spicer, who has seen a very large number of cases, agreed with this. It would appear, then, that this is the general opinion.

The subject is of great importance because of the Workman's Compensation Act. Butler found a history of trauma or an operation in 12 out of 59 cases, or 20 per cent. An examination of his cases suggests the following conclusions: (1) An attack of interstitial keratitis may be precipitated by an accident to a cornea which is disposed to the disease by syphilis or tubercle. (2) It is possible that a slight trauma such as the instillation of drops or the irritation of a general anæsthetic may have the same effect. (3) The attack in the injured eye is liable to be followed by interstitial keratitis in the uninjured eye. (4) It is possible that an injury to one eye may cause interstitial keratitis in the other. (5) The question may be asked, " Is it not possible that in every case of interstitial keratitis, the attack is precipitated by some slight trauma ? "

H. Barkan[1] says that most surgeons have seen interstitial keratitis follow an injury to the eye. Igersheimer, however, in 300 cases found not a single one pointing towards trauma. Barkan, however, believes that traumatic cases are not so infrequent. He discusses the theories of possible causation.

[The facts will interest practitioners. The reviewer suggests that it might be a wise and practicable suggestion to forbid boxing to a boy known to have congenital syphilis.—A. E. J. L.]

REFERENCES.—[1]*Amer. Jour. Ophthalmol.* 1921, Aug., 604; [2]*Brit. Med. Jour.* 1921, ii, 734; [3]*Brit. Jour. Ophthalmol.* 1922, Sept., 413; [4]Abst. *Brit. Jour. Ophthalmol.* 1922, March, 275.

## COXA PLANA. (*See* BONES AND JOINTS, SURGERY OF.)

## CYSTITIS. (*See* BLADDER.)

## DARIER'S DISEASE.

*E. Graham Little, M.D., F.R.C.P.*

Borghoff[1] reports a very early case of Darier's disease, occurring in a male infant of 27 months, the child of American-born white parents. The disease had begun nine months earlier, and when seen occupied the scalp, the back, the chest, the abdomen and lumbar region, the axillæ, and groins. There was intense pruritus. An unusual feature was the presence of a papular efflorescence on the hard palate, in the auditory canal, and around the anus; in the latter position ulceration had occurred in some of these. Histological examination demonstrated the presence of typical 'round bodies' characteristic of the disease. (*See also* MEDICAL ANNUAL 1922, p. 96, for illustration.)

REFERENCE.—[1]*Arch. of Dermatol. and Syph.* 1921, Nov., 609.

## DEMENTIA PRÆCOX. (*See* MENTAL DISEASE.)

## DENGUE.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

J. F. Corson[1] describes a dengue-like fever at Accra, on the Gold Coast, with the usual symptoms, while L. W. Davies and W. B. Johnson[2] record cases of a twelve-day fever apparently of the same group in Nigeria, 15 among Europeans and 3 in natives, infection in which was slight and probably mosquito borne; but J. W. D. Megaw[3] points out that the Nigeria fever differs from dengue in its longer duration of ten to thirteen days, the gradual rise and absence of remission of the temperature, and persistence of the rash, and suggests that the fever very closely resembles that described by him as typhus-like fever in India. W. F. M. Loughnan[4] discusses the unclassified fevers of Jamaica, and describes a short type resembling sandfly fever, a second atypical dengue, and a third rarer form corresponding to Rogers' seven-day fever, which that writer now considers to be sporadic dengue. The cases showed the symptoms and leucopenia of the dengue group of fevers.

REFERENCES.—[1]*Jour. Trop. Med. and Hygiene,* 1921, Oct. 1, 253; [2]*Ibid.* July 15, 189; [3]*Ind. Med. Gaz.* 1921, Oct., 371; [4]*Jour. Trop. Med. and Hygiene,* 1921, Aug. 1, 201.

## DERMATITIS.

*E. Graham Little, M.D., F.R.C.P.*

**Phenolphthalein Eruptions.**—This drug is extensively used in many proprietary laxative preparations, and it has been regarded as a peculiarly harmless aperient. Ayres[1] reports seven cases, including one personal observation, of an erythematous eruption resembling erythema perstans, appearing after taking the drug.

Wise and Abrahamovitz[2] contribute an exhaustive paper on the forms of eruption noted in persons taking this drug, which would seem to enjoy an enormous vogue in the States, from the statements of speakers in the subsequent discussion. The eruption may take the form of "a peculiar polychrome eruption on the skin, with bullous vesicular and eroded lesions of the genitals and the mucosæ". The skin lesions leave pigmented areas which may last for years. These lesions may flare up again after the drug has been resumed. The eruption is very similar to those caused by antipyrin and arsphenamine.

**Dermatitis from Lubricating Oils.**—McLachlan[3] describes a dermatitis frequently met with in persons working with oils used for lubricating cutting machinery. The irritant is partly oil and partly metallic grit, and three types of disorder are common: (1) A folliculitis and perifolliculitis; (2) An eczematoid eruption affecting especially the hands and forearms; (3) Pigmentation with infiltration of the skin, keratoses, wart-like patches, and occasionally epitheliomatous ulcers. Treatment is of little use unless the work is abandoned, in which event recovery is usually rapid under simple boric dressings. It is probable that the oils used become infected with bacteria, and there is a septic element of varying degree in the causation.

**Pyrethrum Dermatitis.**—Pyrethrum is an insecticide powder prepared from chrysanthemums grown chiefly in the East, but more recently cultivated in California. The number of cases is usually higher in summer, probably because the workers' sweat dissolves the powder and makes it more irritant to the skin. Four varieties of eruption may result[4]: (1) An erythema, indicating a slight degree only of response; (2) Vesicular dermatitis, the commonest type, in which the earliest lesions are papules which rapidly become vesicular and are attended by an intense pruritus; (3) A papular type, not becoming vesicular, and also attended by severe itching; (4) An anaphylactic type, in which an erysipeloid congestion of large tracts of skin is noted. Treatment consists in immediate removal of the victims from contact, and preventive measures should include provision of wash-houses in the works, personal cleanliness, and protection of the exposed skin with cold cream or vaseline. Alkaline fluids seem best to relieve the inflammation.

**Dermatitis from Adhesive Plaster.**—Siemens[5] met with a case of dermatitis apparently resulting from the use of *leucoplast,* made by Beiersdorf. The firm very obligingly disclosed the ingredients of this manufacture, which is used all over the world; and the author, trying out all the ingredients, came to the conclusion that the dammar resin which is the chief secret of the admirable adhesiveness of this make was the ingredient at fault. He was able to produce the dermatitis in the susceptible patient by a mixture of one part resin and six parts zinc oxide. Next came the investigation which item of the resin was to be incriminated, the specific acid (*dammarolsaure*), or the two resins, alpha and beta, described under this name, with melting points of 90° and 206° respectively. The author thinks the acid is probably the irritating constituent, but was unable to confirm this experimentally.

**Dermatatis Venenata.**—Strickler[6] recommends intramuscular injections of the toxin of poison ivy as a preventive and ameliorative measure. The substance used was obtained by extracting the active principle from fresh ivy leaves with absolute alcohol, filtering, and precipitating. The finished product is dissolved in alcohol diluted with sterile water, and doses of from ½ to 2 c.c. of the diluted toxin (the standard of dilution is not specified) may be given into the buttock. Sixteen cases thus treated are described in detail, and the results are excellent. The author has no experience of the method of administration by the mouth, advocated by Schamberg (*see* MEDICAL ANNUAL, 1920, p. 305), but thinks it might well be combined with the intramuscular route. Desensitization is probably real, but temporary in duration.

*Experiments with Poison Ivy.*—Brown[7] records some interesting experiments with poison ivy on a group of students. The method used was to place a piece of fresh leaf on the arm and keep it in position with plaster. At the end of twelve hours it was removed, and the subject asked to record his earliest symptoms of erythema or itching. Of nine persons so tested, three were immune. Two of the remaining six showed reaction within seventeen hours, and the others after twenty-four hours. These three had had previous attacks of poisoning. The remaining three, who had never suffered contact before, reacted in 48, 76, and 144 hours respectively. Another group of eleven students were tested with a tincture prepared from the leaves, which was painted on the arm and covered with plaster, as before, for twelve hours. All except two reacted to this, the average time being three days. The tincture would seem to be slower but more certain in its effects than the fresh leaf. The author considers that there is no absolute insusceptibility to ivy poisoning, but there are wide variations in the same person according as the temperature, condition of the skin, etc., vary. It was demonstrated that eruption may be spread by lymph- or blood-channels without direct contact from one part of the body to another. The serum from blisters produced by the irritant was found not to convey the action of the poison. Susceptibility is increased with each attack.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1921, Nov., 1722; [2]*Arch. of Dermatol. and Syph.* 1922, March, 297; [3]*Glasgow Med. Jour.* 1922, April, 212; [4]*Jour. Amer. Med. Assoc.* 1921, Aug. 6, 448; [5]*Münch. med. Woch.* 1921, April 7, 506; [6]*Jour. Amer. Med. Assoc.* 1921, Sept. 17, 910; [7]*Arch. of Dermatol. and Syph.* 1922, June, 693.

## DERMATITIS HERPETIFORMIS.

*E. Graham Little, M.D., F.R.C.P.*

Reith Fraser[1] reports an interesting case of this disease in a South African farmer, in whom the affection had been noted from the early age of 11. He lived a healthy open-air life, but became increasingly subject to outbreaks, and when seen by the author at the age of 19 had a very severe attack, especially of the mucosa of the mouth. Remarkable improvement seemed to result from a weekly intramuscular dose of **Collosol Manganese**, beginning with ½ c.c., soon raised to 1½ c.c.

REFERENCE.—[1]*Lancet*, 1921, ii, 801.

## DIABETES INSIPIDUS.

*John D. Comrie, M.D., F.R.C.P.*

A good deal of experimental and clinical work has been done in relation to this subject, chiefly regarding the influence of the pituitary gland. Hanchett[1] found experimentally that lesions of the pituitary gland are not constant in the production of polyuria; on the other hand, lesions of such a type as to cause traction on the floor of the third ventricle uniformly produced polyuria. When this result had been brought about, he found that intravenous injections of pituitrin temporarily reduced the amount of urine, while intravenous injections of epinephrin had no such effect. Bailey and Bremer,[2] in a somewhat more elaborate series of experiments, found that a lesion, even extremely minute, of the para-infundibular region provoked polyuria with certainty; this might be transient or permanent, depending on the extent of the lesion. Lesion of the tuber cinereum without injury of the pituitary also produced polyuria. Glycosuria was an inconstant result of the lesion, while lesions of the base of the brain outside of the para-infundibular region might produce glycosuria but never polyuria. Weir, Larson, and Rowntree[3] studied the effect of pituitary extract on fifteen cases of diabetes insipidus. Marked temporary effects in reducing the excess of urine were obtained by injection of **Pituitary Extract** in all cases, lasting from a few hours to four or five days. When the pituitary extract was injected in gum acacia, the effect was good, and sometimes lasted longer; effects of shorter duration followed administration by rectum. Histamine was also injected subcutaneously but produced no effect. Lumbar puncture and withdrawal of 5 to 10 c.c. of cerebrospinal fluid also produced no effect. This differs from the experience of Tucker,[4] who, in one case of diabetes insipidus of sudden onset, found that immediate return to a normal excretion of urine followed **Lumbar Puncture**, and that the polyuria had not returned five and a half months later. Similarly Christie and Stewart[5] found permanent disappearance of polyuria in one case after lumbar puncture, and temporary return to normal excretion in another case after pituitary extract. The latter observers found that the various tests for renal efficiency gave normal results. Blumgart[6] found that equally good temporary benefit was obtained by **Hypodermic Injection** or **Intranasal Application of Pituitary Extract**, while histamine, lumbar puncture, and pituitary extract by the mouth were useless. Rabinowitch[7] found a hyperfunction of the pituitary and hypofunction of the adrenals with normal basal metabolism; also a normal renal efficiency except for inability to concentrate salt; the last became normal when pituitary extract was injected.

References.—[1]*Amer. Jour. Med. Sci.* 1922, May, 685; [2]*Arch. of Internal Med.* 1921, Dec., 773; [3]*Ibid.* 1922, March, 306; [4]*Amer. Jour. Med. Sci.* 1922, May, 668; [5]*Arch. o Internal Med.* 1922, May, 555; [6]*Ibid.* April, 508; [7]*Ibid.* 1921, Sept., 355.

## DIABETES MELLITUS. (*See also* Eye Affections; Insulin.)

*John D. Comrie, M.D., F.R.C.P.*

Since Mering and Minkowski in 1889 discovered that a condition of diabetes might follow on experimental excision of the pancreas, efforts have been made to discover the nature and source of the internal secretion whose defect is supposed to be the cause of the hyperglycæmia and glycosuria. Macleod[1] and co-workers claim to have been able to isolate a hormone to which they give the name of **Insulin.** This, freed from admixture with trypsin and other proteolytic enzymes which destroy its activity, can be injected in cases of diabetes; and it is claimed that favourable results in the reduction of blood-sugar have been obtained by its means. The general improvement produced by its administration, according to Banting, Best, and others,[2] include marked reduction of blood-sugar even to normal values, abolition of glycosuria, disappearance of acetone from the urine, evidence from the respiratory quotient of increased utilization of carbohydrates, and improvement in general condition. Insulin is prepared from the pancreas of the ox by means of fractional precipitation with alcohol, as described by Banting and others;[3] but the details of its preparation remain secret, and indeed are protected by patents, so that the remedy was still, at the end of 1922, in the experimental stage.

Prognosis.—Some interesting statistics are given by Joslin[4] with regard to the decreasing mortality from diabetes, despite the increasing incidence, or at all events increasing recognition, of this disease. Deaths from diabetes reached the summit in 1915, when in the registration area of the United States they were 17·5 per 100,000; but in the five successive years they have decreased, being 17·1, 17·0, 15·9, 14·9, and 16·1. He considers that the average Boston diabetic lives more than 50 per cent longer with his diabetes than he did in the period preceding 1914, the average figures being respectively 5·3 and 3·3 years. It is suggested that the rise in the incidence of glycosuria is associated with the greatly increased consumption of sugar in the United States, which has risen from 65 lb. per individual of the population in 1900 to 73 lb. in 1918 and 86 lb. in 1920. In another paper Joslin[5] states that there are in all about one million persons suffering from diabetes in the United States at the present time, so that the lengthening of life by two years coincidently with the use of the diet reduction method has been a great benefit. The results have steadily improved as physicians became more experienced in the practice of this method, and especially with the more liberal use of fat in certain conditions. In his Shattuck Lecture the same writer[6] shows that while the prognosis in regard to duration of life is shorter the younger the person, the greatest proportionate improvement has taken place in the treatment of diabetics under ten years of age, among whom the expectation of life has been doubled since 1913. Heiberg[7] considers that the prognosis is most satisfactory when the under-nutrition of which treatment consists is gradually reached. Lyon[8] gives several points which should be taken into consideration before an opinion is formed in regard to the future progress of the case. These are the degree and rapidity of the body-wasting that has taken place, the total amount of glucose lost daily in the urine, but above all the response to treatment in regard to permanent lowering or abolition of glycosuria.

Causation.—A certain amount of research and discussion has been published in the past year with regard to the cause of diabetes. Although the latest cure depends essentially upon the theory that the perverted metabolism of glucose is directly due to failure of internal secretion normally elaborated by the islands of Langerhans in the pancreas, this is by no means generally accepted as applicable in every case (*see* Medical Annual, 1921, pp. 145, 146). At the Fifteenth French Congress of Medicine, held at Strasbourg in October, 1921, Ambard and Chabanier[9] conclude that, if human diabetes appears to be of pancreatic nature, the mechanism which causes the trouble of metabolism of carbohydrates remains unknown, owing principally to our ignorance regarding the disposal of carbohydrates in the normal organism. Fath[10] further points out that no relation exists between the gravity of diabetes and the intensity of the functional disorders of the pancreas. Mitchell[11] has made a statistical inquiry into the clinical indications of the etiology of diabetes. In a series of 116 cases he found that 56 per cent were of Jewish race. Obesity was a familial characteristic about five times as common in diabetics as in persons not affected with that disease. A definite history of diabetes in some member or members of the immediate family of the diabetic was found in 46 per cent of cases. With regard to exciting causes, he found no evidence of nervous disease, which is much dwelt upon by classic writers such as Naunyn; but history and evidence of gross excess in diet were marked in over 60 per cent of his cases. He refers to the opinions of older writers connecting the occurrence of diabetes with convalescence from some acute infection, especially influenza, and gives details of eight of his own cases in which diabetic symptoms followed immediately upon local or general infection, with another forty-three cases in which there was a suggestive relationship between infection and diabetes. The same factor has been emphasized by Willcox,[12] who considers that the true cause of diabetes is damage to the pancreas by some toxic agent, no doubt bacterial in many cases. He instances the disappearance of severe glycosuria associated with carbuncle after successful treatment of the septic lesion; also the temporary glycosuria often found in mumps and syphilis. He also mentions that, in several cases of diabetes, bacteriological investigation revealed abnormal intestinal infections, such as an excess of pathogenic streptococci and a non-lactose-fermenting Morgan's bacillus.

In the same connection may be mentioned a research by Renshaw and Fairbrother[13] on the significance of a starch-splitting and acetone-forming organism found in the stools of diabetic patients. To this organism they give the name of *Bacillus amyloclasticus intestinalis*, and they suggest that diabetes may be due to an effect of the products of this organism upon the glycogenic function of the liver. Achard[14] attributes many cases of so-called diabetes to a derangement of nutrition—insufficiency of glycolysis—in the course of other diseases; among a number of commoner diseases he instances acromegaly, the adiposo-genital syndrome, and exophthalmic goitre.

Achard, with Ribot and Léon Binet,[15] has recorded some researches on adrenalin diabetes from which he concludes that adrenalin hyperglycæmia is not produced after extirpation of the pancreas, and that the adrenalin prevents the action of the glycolytic ferment from the pancreas, its action being indirect and being suppressed by the previous suppression of the pancreatic ferment in consequence of extirpation.

The relation between diabetes and syphilis has been investigated by Lemann.[16] It is generally believed that diabetes is connected with syphilitic pancreatitis; but as regards the negro at least, with whom Lemann's research deals, he concludes that there is no relation between the incidence of diabetes mellitus and syphilis, and that there is an unexplained immunity of the negro race to the production of spirochætal pancreatitis, just as there is an unexplained immunity of the race to the production of locomotor ataxia. Mason[17] records two cases of diabetes mellitus whose blood gave a strongly positive Wassermann reaction, though there was no history or other sign or symptom of syphilitic infection; both cases showed the further peculiarity that when treated for the latter disease by means of arsenical injections there was a marked and rapid decline of carbohydrate tolerance.

Gorke[18] records one case of diabetes combined with the hæmorrhagic diathesis, both trains of symptoms being greatly relieved by dietetic treatment.

Under the name of 'negligible glycosuria', Leyton[19] gives a record of eighteen cases of what is generally known as 'renal diabetes'; the peculiarity, as he points out, of this type of the disease is that the individual passes constantly a urine containing from 0·1 to 1·0 per cent of glucose, the amount being fairly constant in the same individual irrespective of the food taken. The percentage of sugar in the blood is not above 0·15 per cent, and this absence of hyperglycæmia is the important point that distinguishes these cases from early cases of diabetes. Lewis[20] discusses further the question of renal glycosuria, and concludes that there are two types of this variety of disease: one of unknown origin in which the blood-sugar curve is of strictly normal order, and the other associated with a chronic diffuse nephritis or an arteriosclerosis. Cammidge,[21] as the result of investigating 140 cases of diabetes, came to the conclusion that about 32 per cent were of pancreatic origin, while 34 per cent were probably associated with disturbances in the functions of the liver ; a further 34 per cent were unrelated to any obvious pathological condition.

Blood-sugar Estimation.—With regard to diagnosis and prognosis in diabetic cases, most interest has of late centred round the examination of the blood-sugar. This has been studied chiefly in the two directions, first of finding how much it is raised shortly after a standard test-meal has been taken, and secondly of finding by repeated examinations how long it takes for the amount of blood-sugar to return to its usual level, or, in other words, the nature of the blood-sugar curve. The method hitherto adopted was usually that of Benedict, but Maclean[22] gives a simpler method which has the great advantage of requiring only a small quantity of blood (0·2 c.c.), which is obtained from a prick of finger or ear, and there is no objection to performing it repeatedly. This method has proved quite satisfactory in the hands of many observers, e.g., Brunton,[23] who speaks well of it. The normal amount of the blood-sugar may be taken as about 0·1 per cent ; after a test-meal containing 50 grm. of glucose it may rise in thirty or sixty minutes to somewhere about 0·17 or 0·18 per cent, and at the end of an hour and a half or two hours after the meal it should have fallen to its original amount. If greater amounts of glucose are given, the curve is somewhat higher and the fall is prolonged till later. In glycosuric patients the rise is considerably higher—it may be some such figure as 0·2 or 0·5 per cent—rising over the 'threshold' when glucose appears in the urine ; and as its most typical feature showing a defective 'storage power' in the fact that it does not fall to its previous level for three, four, or more hours. John[24] performs the test by giving 100 grm. of glucose and making the usual repeated examinations of the blood-sugar. If the blood-sugar comes back to normal inside of three hours, the individual is considered non-diabetic ; if after three hours, he is considered diabetic.

The old and simple form of tolerance test, recommended for example by Willcox,[25] consisted in admininstering 100 grm. of glucose. This in the normal person does not cause the blood-sugar to rise above the 'threshold', and no sugar appears in that urine (*see* Medical Annual, 1922, p. 99). A study of the blood-sugar curves following a standard glucose meal is given by Olmsted and Gay,[26] who investigated 200 cases in this way. Their test-meal consisted of glucose, lemon-juice, and water ; but the amounts varied with the size of the patient, being, as far as glucose was concerned, at the rate of 1·75 grm. per kilo of body weight. They found that occasionally healthy individuals actually showed a subnormal curve, the blood-sugar sinking after the glucose meal. In some cases of furunculosis and other low-grade infections the blood-sugar curve was delayed ; in cases of hyperthyroidism the rise was high (to 0·25 or 0·3 per cent), but there was not usually a delay in the fall of the curve ; in hysteria the curve was usually normal ; in manic-depressive insanity the characters were similar to those of hyperthyroidism ; in diabetes, of course, the rise was high and the fall greatly prolonged.

Beeler, Bryan, Cathcart, and Fitz[27] criticize the glucose test-meal from the point of view of the fact which they have demonstrated, that the absorption of glucose shows great differences in different persons, depending apparently on personal idiosyncrasy. They propose, therefore, to modify the test by leaving the glucose solution in the patient's stomach for an hour only, and then drawing off what is left. The blood-sugar estimations are made in the usual way.

Sherrill[28] considers that this glucose-meal followed by blood-sugar tests is of great value in revealing an enormous number of latent or incipient diabetes cases, with or without symptoms, which have hitherto escaped diagnosis. It is obviously of great advantage to such cases that an early diagnosis should be made, before serious symptoms have occurred or severe dietary privations have become necessary. Spence[29] has made a series of observations upon sugar tolerance as it varies at different ages. Tolerance is normally greatest in infancy and tends to become lessened as age advances. In cases of cancer, nephritis, and other devitalizing diseases, the sugar tolerances varied, being normal in younger and decreased in older patients.

Labbé and Nepveux,[30] discussing the meaning of hyperglycæmia in the light of these tests, remind their readers that it indicates a disturbance of glucose regulation, not, however, necessarily of diabetic nature. This is clear from what has been said above as to the variations in curve found by various observers in different diseases. Labbé and Nepveux also have found the curve of hyperglycæmia in lesions of the liver, hyperthyroidism, infections, and intoxications.

Marsh[31] gives the results of prolonged blood examination in a case of 'renal diabetes'. It should be remarked in passing that the term 'renal diabetes' includes those cases in which the blood-sugar curve after a test-meal conforms to the normal curve in height and duration, though the patient has the peculiarity of habitually passing sugar in the urine. Marsh points out that true cases of renal diabetes are rarer than is generally supposed, and that most of those recorded are really mild cases of ordinary diabetes. In the case recorded the blood-sugar curve after 100 grm. of glucose as a test-meal reached its highest point in thirty minutes, fell below its ordinary level in two hours, and yet, even when the level was so low as 0·04 per cent, the patient continued to excrete sugar at the rate of 5 grm. per hour. There was no nephritis or other symptom of ill-health, and when laparotomy happened to become necessary for acute intestinal obstruction the patient passed through it in a perfectly normal manner.

Beeler and Fitz[32] have made a series of observations on glycæmia, glycuresis, and water excretion in obesity, which tend to throw some light upon the development of adiposity. Studying the blood-sugar curves after the administration of 100 grm. of glucose, they found that obese people could be divided into two categories: (1) those with a normal curve who burn or store sugar with unusual rapidity, and so spare fat and protein which accumulate; and (2) those with a curve like that of mild diabetes, who probably are early diabetics and should be treated accordingly.

Cammidge, Forsyth, and Howard[33] draw attention to some factors controlling the normal sugar content of the blood, the chief of which they believe to be the reaction of the latter, so that variations in the percentage of sugar following the ingestion of food are supposed by them to result from changes in the reaction of the blood produced through the absorption of salts formed from the digestive secretions.

A simple method by which the practitioner may recognize, though not quantitatively estimate, an increase in the amount of blood-sugar by heating a few drops of blood in a test-tube with a weak solution of methylene blue, is given by Williamson.[34] The method, though too long to quote, is very easy to carry out at the bedside, and is valuable on account of its simplicity and the important information it affords. Two pieces of apparatus which might be of use in the estimation of blood-sugar by those using special methods are mentioned by John[35] and Weiss[36]. These are respectively a vacuum ampoule aspirator by which 1 c.c. of blood is drawn direct into picric acid solution;

and a combined boiling flask and burette for a micro-method in which Pavy's solution is employed.

Diet in Diabetes.—Speaking generally, the method of treatment by diet restriction still holds the field to the exclusion of others; but various modifications have been introduced as applicable in different circumstances, Minkowski,[37] at the Congress of the German Society for Internal Medicine, recommended the well-known **Oatmeal Diet** as specially suitable in severe cases with acidosis. There is nothing specific in oatmeal except that it supplies a moderate amount of carbohydrate with suitable proportion of fat. In cases of moderate severity, Minkowski considers that alternations between periods of low protein with moderate carbohydrate food, and periods when the diet is rich in protein and free from carbohydrate, often succeed well. Although he admits that it is surprising how readily the strict starvation of the Allen cure can be carried through, he considers that this is apt to be overdone, and prefers the method of **Occasional Hunger Days.** Gorke[38] also states that the experience of German clinicians with Allen's fasting treatment has not been very favourable; he thinks that diabetics weighing about 120 lb. do best when restricted to about 1500 or 2000 calories containing only 50 to 75 grm. protein. Falta[39] advocates the **Alternation of Diet** mentioned above, between periods of strict carbohydrate-free diet and periods poor in proteins with moderate carbohydrate content, in order to keep down acidosis. Lenné[40] emphasizes that it is not the purpose of treatment to eliminate glycosuria in all circumstances, for many patients remain in better health and comfort with slight glycosuria than with sugar-free urine on a strict diet; also the type of carbohydrate which suits best—oatmeal, potato, rice, etc.—varies in different cases. Allen and Sherrill[41] consider that the ideal to be reached is the early diagnosis of cases, which are then to be treated from the outset by **Reduction of the Total Diet** in proportion to the severity of the diabetes, instead of the restriction of any one constituent. Williams,[42] analysing 106 cases whose urine contained reducing substances, speaks highly of the effect of the Allen method of rigid dieting with the object of rendering the urine sugar-free; the best he can show, however, is that among his cases 18 had survived between four and five years.

The nitrogen (protein) requirement for maintenance in diabetes mellitus has been exhaustively studied by Marsh, Newburgh, and Holly.[43] Their general method is to use a **Low Protein, High Fat, Low Carbohydrate Diet.** In favour of this type of diet they contend that the amount of carbohydrate required to metabolize fat is small, the patient's excess of glucose being used up for this purpose, while the small amount of protein and large amount of fat supplied in the food prevent the excessive bodily wasting that is apt to occur when the diet is too rich in protein or contains too few total calories. They give tables showing the advantages of such a diet over a month or so at a time, though it is doubtful if a diet containing so much fat could be long maintained. The practical application will be seen from the case of a patient, age 56, with 5 per cent of glucose in the urine, and blood-sugar 0·55 per cent. He was put on a diet of **Oatmeal and Butter** containing 16 grm. protein, 100 grm. fat, and 10 grm. carbohydrate (supplying 1000 calories), and within six days the urine was free from sugar and acetone, while the blood-sugar had fallen to 0·14 per cent. A few days later the diet was increased to contain 9 grm. protein, 155 grm. fat, and 31 grm. carbohydrate (1550 calories); sugar appeared in the urine, but disappeared after one day of starvation; the diet was continued on the same lines, and the urine and body weight remained satisfactory. The same type of diet is recommended by Wilder,[44] who fixes the protein quota of satisfactory diets at ⅔ grm. of protein per kilo of the patient's body-weight. He also gives charts from which the proper quantities of fat and carbohydrate may be automatically calculated.

Woodyatt,[15] in a paper on diet adjustment in diabetes, strongly recommends a **Rice and Butter Diet.** He states that if one finds, by the experiment of a ladder diet commencing with vegetables (*see* MEDICAL ANNUAL, 1920, p. 92), that a patient can utilize a certain number of grams of carbohydrate, then seventeen times this number is the total number of calories that he is capable of using without glycosuria or acetonuria if the diet is most favourably balanced. From this, incidentally, the severity or mildness of the given case is apparent. His method is illustrated in the case of a patient, age 26, body-weight 90 lb., with large quantities of sugar and acetone in the urine. He was first put for four days on 400 grm. of green vegetables, with clear broth and plenty of water, daily. The sugar decreased slightly, but he remained so weak that it was considered advisable to increase the diet to 114 grm. carbohydrate, 15 grm. fat, and 45 grm. protein (760 calories) for five days. Being stronger, he then fasted for two days, and the urine became sugar-free. After a period of building-up of diet over nine weeks, with fasting periods of two days, which always rendered the urine sugar-free, he was found unable to utilize more than 1000 calories. The diet was then changed to rice and butter, containing 24 grm. carbohydrate, 2·5 grm. protein, and 102 grm. fat (1024 calories); finally **Two Eggs** were added to the rice and butter, making 84 grm. carbohydrate, 25 grm. protein, and 174 grm. fat (2000 calories), and on this the urine remained free from sugar and acetone. The reason, according to Woodyatt, why this high fat diet did so well—and the same applies to many cases of severe diabetes—was because the patient was in a state of extreme fat-starvation. A set of tables is given by Holmes[46] for simplification of the Woodyatt method of calculating this optimal diabetic diet, and a graphic chart is provided in a paper by Hannon and McCann.[47]

Maignon[48] attributes the same reason for the great benefit that follows in emaciated cases of diabetes upon administration of fats, combined with reduction of proteins to the minimum necessary for repair, and suppression of carbohydrate more or less completely according to the case. He recommends **Olive Oil** as a food, or **Emulsion of Sesame Oil,** prepared as follows: Sesame oil 600 grm., distilled water 300 grm., soda solution 5 c.c., to be mixed, shaken repeatedly, allowed to stand for twenty-eight hours, then decanted from the excess of water, sweetened with 20 grm. of glycerin, and flavoured with vanilla. When the sugar disappears from the urine, the dose of oil may be reduced and the usual antidiabetic diet substituted.

The question whether diabetic cases do better on **Multiple Meals** is raised by Gray.[49] This method consists simply in dividing the food so that the patient eats six times in the day. His conclusion is that this helps to lower the blood-sugar, so that the patient gains an increased tolerance and can ultimately take more food with safety. Murayama[50] comes to the same favourable conclusion, and records in detail the treatment of a very intractable case, which became sugar-free only when the three extra meals were taken. The intervals between eating should be about two and a half hours, and the extra meals suggested consist of some fruit or vegetable such as lettuce 30 to 60 grm., with 40 per cent cream 15 grm. Orton[51] gives the names and methods for palatable cooking of a considerable number of **New Vegetables,** which, being of low carbohydrate content, he recommends for the diabetic; e.g., collards, turnip root celery, chard, egg-plant, endive, kale, kohlrabi, vegetable marrow, etc.

Willcox[52] adverts to the fact that **Glucose given Rectally** in diabetes does not cause glycosuria, and suggests its trial in this way for dietetic administration in diabetes.

*Diabetes in children* is notoriously hard to treat. Labbé[53] has had experience of thirty cases, and has found meat particularly bad for them. **Milk** is well borne by children, though it tends to increase the glycosuria; this can, however, be abolished readily by periods of restriction for ten days to **Green Vegetables**, and children willingly submit to this diet if the vegetables are sufficiently varied.

OTHER THERAPEUTIC MEASURES.—**Insulin** has been already mentioned, and is further dealt with elsewhere under that heading.

The relation of diabetes to *surgery* is discussed by Kreeke,[54] who considers that surgical procedures should be conservative, and avoided unless absolutely necessary. Bernheim,[55] with regard to gangrene, however, records several cases in which not only were gangrenous limbs removed successfully, but thereafter the blood-sugar was greatly reduced, presumably in consequence of the disappearance of the septic focus.

John[56] has investigated the action of **Infusion of Eucalyptus**, which has frequently been recommended in diabetes. In some twenty cases he found that it was entirely without influence on the blood-sugar or the glycosuria; but as patients like the infusion it forms a useful substitute for coffee, tea, etc.

Loning[57] refers to the beneficial action of **Metabolin** isolated from the pancreas, and of **Yeast**, which he has found useful in diabetes. Klotz and Höpfner[58] also speak of the value in children suffering from diabetes that they have found to be possessed by yeast and **Fresh Carrot**; they attribute the beneficial effect to the action of contained **Vitamins.**

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## DIGITALIS. (*See also* BRADYCARDIA.)

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Most writers prescribe digitalis in moderate doses, while some, regarding the drug as dangerous, venture only upon small doses. Thus Fiessinger[1] rarely gives more than $\frac{1}{10}$ mgrm. of crystallized digitalin in the twenty-four hours, a dose equivalent to 15 or 20 drops of the tincture of digitalis at $\frac{1}{10}$ strength.

There is no doubt that his writings have induced in the minds of many practitioners a real dread of moderate or full doses of digitalis.

The writer [C. L.][2] has made many protests against the arbitrary total dosage of 1 mgrm. of crystallized digitalin which many physicians do not venture to exceed in a course covering several days; but it is admitted that this should be looked upon as a maximum daily dose. He thinks that in gross cardiac insufficiency associated with auricular fibrillation, and in repeated attacks of gross cardiac breakdown, an intensive and prolonged course of digitalis should be pushed until the pulse is slowed to 60 or 70. He gives diminishing doses: for example, 0·4 mgrm. on the first day, 0·2 during several days, 0·1 on the following days, making a total of 1·5 to 2·5 mgrm. in a course of one or two weeks. The patient is seen daily. As soon as the desired effect is obtained or saturation achieved (as shown by slowing of the pulse to 70, or nausea and diarrhœa), the drug is stopped for four or five days, and then resumed in similar or smaller doses. This plan is like that used by Mackenzie,[3] who criticizes the small-dose method. His custom is to give the tincture in doses of 15 or 20 drops three times daily, a result being achieved as a rule in three to five days. According to him, doses sufficient to produce a physiological reaction, such as nausea, diarrhœa, or slowing of the heart, should be given. Once this result is attained, he stops the drug for forty-eight hours, and resumes it in smaller doses to maintain the good results achieved.

Gallavardin and Bocca[4] report an interesting case of massive digitalin poisoning. A man, age 28, had attempted suicide by taking a bottle of Nativelle's crystallized digitalin. After incessant vomiting which came on an hour later, there was a phase of irregular slow pulse; the normal rhythm returned in four days. The usefulness of atropine sulphate, 1 mgrm. two or three times daily by hypodermic injection during this arrhythmia phase, is worthy of note. This observation goes to show that crystallized digitalin is less toxic than one had been led to suppose.

Finally, it may be noted that Mollard[5] has lately attacked the small-dose method, saying he has often found it useless, and reporting a characteristic example.

*Ouabain and Digitalis: New Preparations.*—Vaquez and Lutembacher,[6] introducing the crystallized ouabain of Arnaud (the active principle of *Strophanthus gratus*), found intramuscular injection very painful and oral ingestion unreliable. For these reasons they limited themselves to intravenous administration, 0·25 mgrm. the first day, 0·5 mgrm. the next two or three days, then no more for a week, resuming them if necessary. But in the course of 1922, theses by Bellon[7] and Dimitracoff[8] showed that excellent results could be attained by oral administration: either in glycerin alcohol (1–1000) solution, or in tablets each containing 0·1 mgrm. Ouabain may also be given intramuscularly[9] in doses of 0·5 mgrm., in solution with glucose and stovaine.

*The Respective Indications for Digitalis and Ouabain.*—According to Vaquez and Lutembacher, ouabain acts on cardiac contractility and tonus. Its action on the frequency of contraction is feeble. The action of digitalis, on the other hand, is almost limited to slowing of the heart, and its direct effect on contractility and tonus is almost negligible. Ouabain should therefore be used particularly for cardiac insufficiency, above all for that of the left ventricle.

The writer [C. L.] has frequently, and once more quite recently,[10] opposed this view of the action of digitalis, a hypothesis which would relegate the drug to a second class among cardiac tonics. As a matter of fact he has achieved good results with digitalis even when it has caused little or no slowing of the pulse. Gallavardin[11] lately extolled its value in cardiac insufficiency associated with the permanently slow pulse of total heart-block. And, like Danielopolu and Gallavardin, we have seen it do good in insufficiency of the left ventricle, particularly in cases with alternating pulse.

Consequently, we agree with Danielopolu[12] in believing that the differences between the action of digitalis and that of ouabain are trifling. Both have, in practice, an effective action on contractility, but digitalis has also a slowing effect not possessed by ouabain. We therefore consider that *the drug for cardiac insufficiency with quick pulse is digitalis, and ouabain for slow hearts or coupled rhythms.*

*Methods of Administration.*—

*a. By mouth* is the method of choice. One of us, following the teaching of Bellon and of Dimitracoff as well as of our own practice, advises the use of a dose of ouabain double, or in critical cases treble, the amount of digitalin which would be given for that particular case.

*b. Intramuscular injection* is indicated when the digestive tract does not tolerate solutions and tablets of ouabain or digitalis, and in cases where a rapid and intense action is desirable, whether the oral method has failed or no. The dosage of digitalis is the same as by mouth, and the easiest preparations to use are 'whole' extracts of digitalis in distilled water (digalen, digifolin, etc.). The dose of ouabain is $\frac{1}{2}$ mgrm. (ampoules put up with glucose and stovaine) daily, for, say, four to seven days. These ampoules have up to now been used very little.

*c. Intravenous injection* should only be regarded as an exceptional method. It is indicated in cases of great urgency, and also in chronic cases where the oral and intramuscular methods have failed. The general indications for digitalis and ouabain respectively hold good here also. It should be noted that Vaquez recommends ouabain after bleeding in the acute cardiac breakdown of acute pulmonary œdema, while Danielopolu equally prefers it to digitalis in the acute myocarditis of serious infection.

We quite agree with Danielopolu, Laubry, and Pezzi,[13] in advising that no more than $\frac{1}{4}$ mgrm. of ouabain be given intravenously. Danielopolu thinks a dose of $\frac{1}{2}$ mgrm. dangerous, and Laubry and Pezzi have twice seen it followed quickly by death. The daily injection of $\frac{1}{4}$ mgrm. may be repeated for five to ten days following; in case of need it may be given twice daily for several days. It is wise, but not essential, to wait three or four days if the patient has just been taking digitalis in full doses.

For giving digitalis intravenously, either crystallized digitalin[11] (the Fr. *Codex* solution as used orally, and sometimes diluted with 1 or 2 c.c. of artificial serum) or 'whole' extracts of digitalis may be used. We have advised[15] that the dose should not exceed the equivalent of 0·3 to 0·4 mgrm. of digitalin, but our experience with ouabain would lead us now to use 0·2 mgrm. of digitalin, so that it might be given twice daily if necessary. For the duration of the treatment, the general rule of digitalis medication should be followed (*see above*). The only practical contra-indication to these drugs is malignant endocarditis. Renal insufficiency calls for prudence, but is not a contra-indication in the strict sense of the term.[16]

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## DIPHTHERIA. (*See also* EYE AFFECTIONS.)

*J. D. Rolleston, M.D.*

BACTERIOLOGY.—According to B. C. Marshall and C. G. Guthrie,[1] the ordinary practice of making one or more examinations of a throat swab within the first twenty-four hours when dealing with carriers may not yield all the information available, and may lead to erroneous conclusions. Of 549 cultures which were negative when first examined by them, 52, or 9·47 per cent, were positive on examination after an additional incubation of twenty-four hours. Similar results were obtained in 1912 by Knebel, who found that among 576 negative cultures from diphtheria convalescents, 55, or 9·54 per cent, were positive when examined after another twenty-four hours' incubation, so that out of a total of 1125 cases in which the cultures were negative after examination within twenty-four hours, 107, or 9·51 per cent, were positive on re-examination.

Several German observers, such as E. Singer,[2] K. Meyer,[3] F. Port,[4] and H. Lippmann,[5] have recently reported cases in which diphtheria bacilli were found in the sputum of persons suffering from pulmonary tuberculosis or other affections of the respiratory system. With the exception of Singer's case, however, in which the sputum became non-purulent and free from bacilli after injection of antitoxin, the bacilli in these cases were not virulent.

SYMPTOMS.—Some years ago the reviewer[6] illustrated the rarity of *diphtheria in the first year of life*, and particularly of faucial diphtheria, by the following statistics. During the 15 years 1900–14 the percentage of diphtheria patients at this age admitted to the Metropolitan Asylums Board's hospitals remained fairly constant, ranging between 1·5 and 2·8 per cent; while among 2600 consecutive cases under his care in the course of 12 years, only 20, or less than 1 per cent, were in the first year of life, and of those only 13 had any faucial involvement. G. Blechmann and M. Chevalley,[7] who agree with the reviewer as to the rarity of diphtheria at this age, report a fatal case of faucial diphtheria in an infant, age 1 month, who ten days before the onset of the disease had shown a negative Schick reaction.

Two cases of *diphtheria of the larynx in adults*, to the rarity of which the reviewer has drawn attention (*see* MEDICAL ANNUAL, 1918, p. 159), are recorded by Troisier, Wolf, and Marquézy[8], in a man, age 50, and a woman, age 23, admitted to hospital with recession, loss of voice, and paroxysmal attacks of suffocation. Neither had had any previous sore throat or any membrane on the tonsils. After laryngoscopic examination of the man, who showed only œdema of the aryepiglottic folds and vocal cords, a dyspnœal attack necessitating tracheotomy took place, and death occurred a few minutes after the operation. Post mortem, membrane was found extending from the vocal cords to the bifurcation of the trachea. In the second case laryngotomy was performed at once, and was followed by tracheotomy three hours later. Recovery took place after the use of large doses of antitoxin. These cases show that the possibility of diphtheria should always be considered in the case of acute primary laryngitis in the adult. Laryngoscopy in such cases is often deceptive, as the supralaryngeal œdema may prevent the membrane on the larynx being seen.

According to W. Haupt,[9] *diphtheritic infection of the puerperal uterus* is rare. Unlike faucial diphtheria, in which the diagnosis can usually be made from the clinical appearances, puerperal diphtheria as a rule can only be diagnosed by bacteriological examination, as in the case of wound diphtheria, to which it is closely allied. The prognosis is favourable, provided the correct diagnosis is made early and is followed by specific treatment.

M. Mallardi[10] reports a case of *primary anal diphtheria* in a male infant, age 22 months, whose symptoms were pain and irritation in the genitals and perineum. The anal orifice was red and swollen. On separating the folds, two small fissures with grey exudation were seen. The glands in the peri-anal region were enlarged. There were fever and constitutional disturbance. Recovery took place under treatment by **Antitoxin** and local applications of **Ichthyol** and **Hydrogen Peroxide.**

C. H. Smith[11] examined 242 cases of diphtheria, and found that 72 per cent had no evidence of *cardiac disturbance*[11] apart from an initial tachycardia of 135 to 172. The remaining 28 per cent, after an interval of several days, showed certain changes in the pulse, namely, sinus arrhythmia and sino-auricular block in 65 per cent, and premature contractions in 20 per cent, but without any symptoms or signs of circulatory embarrassment. The remaining 15 per cent consisted of high-grade heart-block which was very sudden in onset and was associated with very urgent cardio-circulatory symptoms, with death within thirty-six hours. Auricular fibrillation was not observed.

The rarity of *peripheral gangrene* following diphtheria is shown by the fact that the reviewer, who saw a case in 1910 (*see* MEDICAL ANNUAL, 1912, p. 229), could find only ten others in the literature at that time. M. B. Gordon and B. Newman[12] now record a case in a boy, age 6, which is the fourth to be reported in American literature. Like the previous cases, it occurred in the hypertoxic type of diphtheria in which symptoms of cardiac insufficiency had already developed, and after the local throat symptoms had disappeared. The course was a typical one of myocarditis with sluggish circulation, low blood-pressure, and deficient collateral circulation. As in the reviewer's case, the child's general condition at the onset was too critical to permit any operation. Later on a natural amputation of the gangrenous area on the right heel and a separation of the tissues down to the bone were allowed to take place, and it was not until four months after the onset of diphtheria that an operation was performed, consisting in amputation of the first right metatarsophalangeal joint. The boy was discharged from hospital within three weeks of the operation, when he was able to walk without any obvious deformity.

H. R. Mixsell and E. Giddings[13] report 8 cases of *diaphragmatic paralysis*, all of them fatal, which occurred among 4259 cases of diphtheria, or in 0·2 per cent, as compared with 16 cases, or 0·6 per cent, observed by the reviewer among 2300 cases of diphtheria. In each of the cases the initial attack had been severe, and in all but one antitoxin had not been given until after the third day of disease. The average time of onset for the paralysis was the thirty-ninth day, and the duration of the paralysis averaged thirty-six hours. Apart from the method of continuous artificial respiration which Marriott alone seems to have employed (*see* MEDICAL ANNUAL, 1921, p. 152), no treatment appears to be of any benefit.

M. P. Weil and J. Huhnil[14] report a case of the *association of diphtheritic paralysis with tabes* in a man, age 35, who had contracted syphilis seven years previously, for which he had had no treatment. The tabes was present only in an incomplete form (*forme fruste*), being manifested merely by loss of reflexes, cerebrospinal lymphocytosis, and a positive Wassermann reaction in the blood and cerebrospinal fluid. The spinal character of the diphtheritic paralysis (quadriplegia with transient retention of urine) was probably determined by the existence of tabes, and at the same time the diphtheritic intoxication probably aggravated the syphilitic process, as the Wassermann reaction was more intensely positive than is usual in chronic tabes, and the lymphocytosis and albuminuria in the cerebrospinal fluid increased in spite of the disappearance of the paralytic symptoms.

H. Powers[15] has collected eight cases of *disseminated myelitis* following diphtheria, including one of his own in a boy of 10. The clinical picture was complete, but apparently myelitis did not end in sclerosis, as apart from a suggestion of nystagmus complete recovery took place.

*Optic neuritis* is generally regarded as a rare complication of diphtheria, but C. Fromaget[16] thinks that it would probably be found to be much more frequent if a systematic examination were made of the fundi of all diphtheria patients. He records an example of double optic neuritis in a woman, age 32, which developed in association with palatal palsy three weeks after a mild attack of faucial diphtheria. Recovery took place in a fortnight's time.

A remarkable example of a *chronic carrier* is reported by Urbantschitsch.[17] The patient was a youth, age 17, who had scarlet fever at eighteen months and scarlet fever and diphtheria at three years of age, since when he had suffered from bilateral suppurative otitis media. A bilateral mastoid operation was performed at the age of seventeen, and diphtheria bacilli were found in the middle ear on both sides. Meningitis subsequently developed, and the autopsy showed extensive encephalitis without any abscess formation. Bacteriological examination of the pus at the base of the brain showed diphtheria bacilli and streptococci.

Prophylaxis.—R. A. O'Brien, A. J. Eagleton, C. C. Okell, and E. M. Baxter[18] carried out 1150 Schick tests, with the following results: (1) Only 56 out of 160 medical students gave a negative reaction; in other words, only 35 per cent of this group were immune to diphtheria. (2) Among 22 nurses in the same institution, only 45 per cent were immune. (3) In a hospital staff of 182 adults consisting of doctors, nurses, and attendants, 78 per cent were immune. (5) In a group of 734 in an institution where diphtheria had recently occurred, 534, or 73 per cent, were immune. Brothers and sisters usually gave the same reaction. If the younger were negative, the older were also negative.

A. Zingher[19] claims that three doses of toxin-antitoxin each from 1 to 5 c.c. injected at intervals of two weeks give much better immunity results than two doses of the same amount injected one week apart. A longer interval between the injections of toxin-antitoxin enables the local reaction to disappear more completely before the next dose of toxin-antitoxin is given. There may also be a better antitoxin response when the injections are given two weeks apart. Zingher recommends that at least six months should elapse before another Schick test is made to determine the development of active immunity. Those who have not become immune after the first series should be given a second series of two or three injections. From 70 to 93 per cent of the children in the New York City schools were rendered immune after two series of toxin-antitoxin injections, but there are a few children who fail to develop immunity after several series of injections of toxin-antitoxin.

J. V. Cooke[20] reports the results of systematic immunization of all susceptible individuals in a nurses' training school at St. Louis. Schick tests were performed on 147 nurses, of whom 61, or 41·5 per cent, gave negative, and 86, or 58·5 per cent gave positive, reactions. This high percentage of positive reactions differs considerably from the figures generally given for adults, and is usually explained by the majority of the nurses having come from small communities where diphtheria is far less prevalent than in cities. Zingher and others have shown that contact with diphtheria, such as is more likely to occur in a congested urban population than in a rural community, plays an important part in the development of antitoxic immunity. Toxin-antitoxin was given to 62 nurses with positive Schick reactions, and, when retested from four to six months later, 47, or 75·8 per cent, were immune; 2 more gave negative reactions nine and fifteen weeks respectively after the injections, bringing the total number immunized up to 79 per cent. Usually there was well-marked local redness, with swelling and tenderness of an area several cubic centimetres in diameter persisting for twenty-four hours to forty-eight hours. In only 2 was the effect at all severe. A marked general reaction with a chill and a temperature of 103° followed the injection, with general malaise and headache, which lasted three to four days. The arm was greatly swollen from elbow to shoulder, with a large area of red and purplish discoloration at the site of injection, accompanied by marked tenderness and disability. A similar reaction followed each injection. As the result of the immunization there was a decrease in the incidence of clinical diphtheria among the nurses of at least 90 per cent as compared with a previous three-years' period.

Cooke concludes that it is relatively easy to protect an entire nursing staff from contracting diphtheria by the Schick test and toxin-antitoxin injections, and recommends that this procedure should be carried out in all institutions caring for children.

Treatment.—In advocating **Low versus High Tracheotomy,** E. Seifert[21] maintains that the only advantage of high tracheotomy is the simplicity of its technique, which is counterbalanced by the following drawbacks : frequency of granulation tissue and scar formation with subsequent stenosis and curvature of the trachea giving rise to difficulty in removal of the tube, and impairment of speech due to damage to the arytenoid cartilage. On the other hand, the advantages of the low operation are the easy removal of the tube owing to the absence of functional and mechanical stenosis, and the absence of any damage to the arytenoid cartilage and vocal apparatus. Seifert attributes the occurrence of secondary hæmorrhage after low tracheotomy less to the operation itself than to delay in removal of the tube. Of 139 cases of laryngeal diphtheria in children in whom the low operation was performed at the Wurzburg Surgical Clinic within recent years, 33 died—a mortality of 23·7 per cent—death being due mainly to bronchitis or bronchopneumonia. The tube was removed on the third day, and in no case was it left in after the eighth day. Seifert concludes that if suitable technique and after-treatment be employed, the drawbacks connected with low tracheotomy can be reduced to a minimum, and that its advantages entitle it to general employment.

Dujarric de la Rivière[22] recommends **Treatment of Carriers with Hot Air,** a method which he has employed in 50 cases, an ordinary electric dryer with a sterilizable mouthpiece 5 cm. long being used. The patient's lips are smeared with vaseline, and the extremity of the mouthpiece is placed on a level with the buccal orifice. A wooden tongue depressor is used by the patient, and a stream of hot air is directed on the tonsils for ten to fifteen minutes at a time, with intervals of half a minute in which the apparatus is withdrawn. As a rule three to five sittings are sufficient to rid the throat of bacilli. The method can readily be carried out in adults, but in children may be difficult or impossible owing to a spasm of the throat concealing the tonsils.

References.—[1]*Johns Hop. Hosp. Bull.* 1922, 110 ; [2]*Med. Klinik,* 1921, 1416 ; [3]*Ibid.* 1520 ; [4]*Münch. med. Woch.* 1921, 949 ; [5]*Ibid.* 772 ; [6]*Amer. Jour. Dis. Child.* 1916, ii, 47 ; [7]*Le Nourrisson,* 1922, 44 ; [8]*Bull. Soc. méd. Hôp. de Paris,* 1922, 557 ; [9]*Med. Klinik,* 1921, 499 ; [10]*Pediatria.* 1921, 318 ; [11]*Jour. Amer. Med. Assoc.* 1921, ii, 765 ; [12]*Amer. Jour. Dis. Child.* 1922, i, 142 ; [13]*Jour. Amer. Med. Assoc.* 1921, ii, 590 : [14]*Paris méd.* 1922, ii, 169 ; [15]*Boston Med. and Surg. Jour.* 1922, i, 45 ; [16]*Jour. de Méd. de Bordeaux,* 1922, 142 : [17]*Wien. med. Woch.* 1921, 804 ; [18]*Lancet,* 1922, i, 739 ; [19]*Jour. Amer. Med. Assoc.* 1922, i, 1945 ; [20]*Amer. Jour. Dis. Child.* 1922, i, 496 ; [21]*Centralb. f. Chir.* 1922, 589 ; [22]*Bull. de l'Acad. de Méd.* 1921, i, 542.

### DUODENAL ULCER. (*See* Gastric and Duodenal Ulcer.)

### DYSENTERY, AMŒBIC. (*See* Amœbiasis.)

## DYSENTERY, BACILLARY. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Etiology.—J. Anderson[1] deals with his experience, both clinical and laboratory, in the Near East during the war. Over 90 per cent of the cases were bacillary, as evidenced by absence of amœbæ and frequent positive agglutination, and showed an epidemic rise in the autumn of 1916 and of 1917. Owing to so many of the cases being received at the base in too late a stage to allow of positive cultures being commonly obtained, great attention was paid to the cytology of the stools, of which the value was proved by Willmore and Shearman. His work, showing a great excess of polynuclear leucocytes in bacillary dysentery stools, as compared with those of amœbic disease, was confirmed by actual counts of 500 cells in 15 acute bacillary and in 5 acute amœbic cases, the average percentages being as follows:—

| Type of Cell | Bacillary Cases | Amœbic Cases |
|---|---|---|
| Polynuclears . . . . | 90·69 | 7·5 |
| Large mononuclears . . | 1·61 | 0·7 |
| Lymphocytes . . . . | 2·80 | 2·5 |
| Eosinophils . . . . | 0·01 | 3·2 |
| Epithelial cells . . . . | 1·48 | 1·3 |
| Macrophages . . . . | 1·80 | 0·0 |
| Pyknotic cells . . . . | 0·00 | 83·0 |

Thus polynuclear leucocytes and macrophages were greatly in excess in bacillary disease, and eosinophils and pyknotic cells in amœbic. Dysentery bacilli could rarely be discovered in stools passed eight hours or more previously, and only 8·3 per cent of stools examined for them gave positive results when sent by post; but very early examination in a laboratory adjacent to the hospital gave 60 per cent successes. By the cytological method a provisional diagnosis can be arrived at twenty-four or more hours before a bacteriological one.

W. Moodie[2] reports on bacillary dysentery in the Claybury Asylum. Figures for English asylums in 1919 showed 3 per cent of the total deaths to be due to dysentery, always of the bacillary form, while the maximum incidence occurred in the winter months, when the patients are largely confined within doors by climatic conditions, indicating direct spread from patient to patient rather than infection carried by flies. Relapses are frequent, while in the intervals between the attacks dysentery bacilli can rarely be found in the stools, so every dysentery case must be treated as a potential carrier and permanently isolated. At Claybury all recent cases have occurred in wards where dysentery patients were previously housed. Bacteriological examinations have been made in all dysentery and diarrhœa cases, and colonies tested for agglutination with Dreyer's Oxford Flexner serum, allowing of a report being made in forty-eight hours, every positive result having been confirmed by subsequent sugar reactions. Agglutination of the patients' blood with Dreyer's and Dudgeon's antigen appeared in the sixth and fourth weeks respectively, and disappeared in both cases in the fourteenth week, so they are of little diagnostic value.

J. W. D. Megaw[3], Director of the Calcutta School of Tropical Medicine, records a preliminary note on chronic dysenteric peritonitis, which he believes to be secondary to bacillary dysentery and to give rise to a fatal form of ascites by causing what was termed by Sprawson 'chronic superior peritonitis'. Megaw has observed 61 cases of ascites in two years in the Lucknow Medical

College Hospital, mostly 25 to 40 years of age, not especially affecting either sex, and mostly with a previous history of dysentery or diarrhœa within a few months, and sometimes irregular non-malarial fever, while in 19 out of 40 cases a positive agglutination reaction in dilutions of 1–80 to 1–160 were obtained. On tapping, the fluid readily reaccumulates, and the average duration is probably under six months. In five post-mortems general fibrotic thickening of the peritoneum and fibrous adhesion of the liver and spleen with neighbouring viscera were found, with cirrhosis of the liver in only one, while chronic bacillary dysenteric ulcers were found in the colon in three cases. In one of three early cases, fixation of the omentum in the rectal sheath left the patient in good health a year later.

F. P. Mackie[4] reports his laboratory experience in Mesopotamia. He found, in early acute bacillary dysentery, that stools resembling scrapings of raw flesh floating in raw meat juice, with pus, and intestinal and macrophage cells free from amœbæ, were diagnostic, while fresh non-acid stools gave cultures of Shiga and Flexner bacilli in nearly 60 per cent, and serum was only effective in this stage. Positive cultures fell from 50·9 per cent in the first week to 39·7 per cent in the fourth. In Indians the cases were less severe than in British troops. Dysentery bacilli could not be cultivated from the blood during life, or from the liver, bile, or mesenteric glands after death, it being thus a local bowel disease. Flies spread the disease, and nearly all contained coli, and two showed dysentery bacilli.

Treatment.—R. R. Stawell[5] records his experience of the treatment of bacillary dysentery in the Near East during the war, and in Australia, and agrees that salines and serum give the best results, but are not generally used by practitioners in Australia. In the acute stage milk should not be given, but water, barley-water, arrowroot, etc., and salines subcutaneously if there is much dehydration of the tissues. He has never seen any benefit from appendicostomy. H. W. Josephs and W. C. Davison[6] have not observed any benefit from polyvalent antidysenteric serum in bacillary dysentery of children in Baltimore during 1919–20, although the diagnosis was confirmed bacteriologically. It appeared to be harmless in 20 to 50-c.c. doses intramuscularly, but neither the duration nor the symptoms were affected by the treatment, which was very painful.

References.—[1]*Lancet*, 1921, ii, 998; [2]*Ibid.* 225; [3]*Ind. Med. Gaz.* 1921, 321; [4]*Ibid.* 1922, 85; [5]*Med. Jour. of Australia*, 1921, 496; [6]*Jour. Amer. Med. Assoc.* 1921, ii, 1863.

## EAR, DISEASES OF.

*A. J. M. Wright, M.B., F.R.C.S.*

### Otitis Externa.

Inflammations of the auditory meatus, occurring in the form of crops of boils or of an acute or chronic dermatitis, are frequently very troublesome, owing to the deafness from obstruction of the canal and the irritation and pain. The essential in treatment seems to be the application of a suitable antiseptic to the whole of the affected area, and this frequently necessitates a gentle dilatation of the inflamed passage. Seal[1] has elaborated a technique for the employment of **Acriflavine** and gauze packing. The meatus is cleaned as thoroughly as possible with dry wool swabs. It is then packed as tightly as possible—approaching, but not quite reaching, the membrane—with thin gauze strips saturated with a 1–1000 solution of acriflavine. The patient is supplied with some of the solution, and instructed to moisten the packing every few hours with a dropper. The packing is renewed by the surgeon at intervals of twenty-four hours, and a cure may be expected in the course of a week or so.

## EAR DISEASE IN BATHERS.

That bathing involves some small degree of risk to the ears is generally recognized. The occurrence of otitis media, probably owing to the blowing of infection up the Eustachian tube during bathing, was referred to in the MEDICAL ANNUAL of 1921, p. 350. Rovinsky[2] has laid down the precautions to be observed with the object of minimizing the risk of damage to the ears. Individuals with nasal obstruction of any sort should be warned against the possibility of such injury, and advised to avoid forcible nose-blowing on emerging from the water. Those who are predisposed to the accumulation of cerumen should ensure that a plug is not present, as the water tends to swell this and produce an irritation of the meatal lining. In the presence of an active chronic suppuration in the middle ear, bathing should probably be forbidden, and the existence of a chronic middle ear catarrhal condition contra-indicates diving and should shorten the duration of the bathe. In the case of an individual with a dry perforation, the meatus should be closed with a wool plug immersed in some oily material. A smearing of the meatus with an antiseptic ointment will prevent infection in those who are subject to meatal boils.

## OTITIS MEDIA IN THE INFANT.

Owing to the small size of the parts, with the resulting difficulty in examination, and the inability of the patient to make his sensations known, there is no doubt that otitis media in the infant is very frequently undiagnosed and consequently untreated, with disastrous results. Leroux[3] has dealt very thoroughly with this subject in a most suggestive article. Inflammation of the middle ear in the newly-born child is undoubtedly very frequent, and a not uncommon cause of general ill-health, meningitis, and deaf-mutism, from extension to the labyrinth. The diagnosis of acute otitis media in the adult depends on the presence of pain, fever, and deafness, together with an examination of the tympanic membrane, which is relatively easily carried out. In the past, the diagnosis of such a condition in the infant has, in a very great majority of cases, rested on the fact that the meatus is observed to be full of pus. Where the discharge is absent or scanty, the condition has been almost inevitably overlooked. It is a commonplace in the experience of every otologist that a large number of cases are seen in adult life in which a suppurative condition of the middle ear must have existed in infancy, although no history can be obtained of this.

Acute otitis media in the infant is probably very much more frequent than in the adult, for the following reasons: Infection in either case takes place from the nasopharynx via the Eustachian tube. In the new-born child, the middle ear contains remnants of embryonic mucoid material which is probably only expelled when air first enters the middle ear via the Eustachian tube. The presence of this material probably acts as an excellent culture medium. In addition, the Eustachian tube is relatively shorter and actually wider than in the adult, while the lymphoid tissues of the pharynx and nasopharynx, with their susceptibility to infections, are present in greater degree. At birth, there is a liability to the inspiration of infected material through the nose, and the feeding of the infant while lying flat on its back renders the passage of infected food material up the Eustachian tubes relatively easy.

This view is supported by the fact that tuberculosis of the middle ear is relatively very much more frequent in the infant, probably owing to a direct infection by tuberculous milk.

## ACUTE OTITIS MEDIA.

*Indication for Mastoid Operation.*—There is no question as to the advisability of operation in those cases of acute otitis media which present signs or symptoms of extension of the disease to the mastoid process or intracranial structures. How far it is advisable to attempt to prevent an acute suppuration drifting into a chronic condition by providing further drainage through the mastoid antrum, is not so well established. Opinion is undoubtedly moving in the direction of earlier operation on such cases. Van Iterson[4] considers that simple drainage of the mastoid should be provided in every case of acute suppurative otitis media which shows no improvement after at least three weeks' thorough treatment. Mackenzie[5] advocates operation after as short a period as ten days from the time of rupture of the membrane. Phillips[6] gives what may be regarded as a reasonable standpoint. He advises careful antiseptic local treatment to the ear for about six weeks, including, if necessary, an incision in the membrane to enlarge the perforation. If at the end of that period the condition has not subsided, he advises drainage of the mastoid antrum, because he finds that it quickly cures the discharge, prevents local extension to the bone, removes risks of intracranial complication, and, last but not least, minimizes damage to the hearing. To sum up: A normal case of acute suppurative otitis media runs a course of about three weeks, at the end of which period it should have almost, if not quite, resolved, with recovery of hearing. Indications for incision in the membrane and for operating on the mastoid for complications were dealt with in the MEDICAL ANNUAL of 1922, p. 112. In those cases which do not clear up after this period, an operation should be advised, as in a very large majority of cases it does prevent the condition becoming chronic, and, what is quite as important, it does undoubtedly diminish the degree of damage to the middle ear and consequently to the hearing.

*Facial Paralysis.*—Facial paralysis occurs not very infrequently in cases of acute middle-ear suppuration. Danelius[7] recorded it in 7 out of 700 cases. He comes to the conclusion that this symptom should be regarded as an absolute indication for operation, because it sometimes indicates an extension of the disease to the bone, and it is impossible to tell in which cases this is taking place.

*Latent Mastoiditis.*—This condition was referred to in the MEDICAL ANNUAL of 1922, p. 113, but experience shows that it is a matter of considerable importance and is not yet generally realized. Phillips and Friesner,[8] in an article on this subject, point out this need. These cases when first seen frequently present typical appearances of an advanced mastoid suppuration, owing to the fact that aural discharge has been entirely absent. They relate five such cases, in all of which a perisinus abscess was present, and Mollison[9] has recorded two cases in which, in addition, a thrombosis of the lateral sinus was present but without any otorrhœa at any stage. Presumably an acute otitis media has been present at the beginning; but while the condition in the middle ear subsides without rupture of the membrane, the inflammation in the mastoid process progresses. Therefore discharge from the ear should not be regarded as a necessary sign in cases of mastoiditis.

## CHRONIC SUPPURATIVE OTITIS MEDIA.

*Symptomatic Headache.*—While headache, particularly frontal, is regarded as an indication for excluding disease in the nasal accessory sinuses, Culbert[10] points out that such headache may not infrequently be due to an unrecognized focus of chronic disease in the middle ear or mastoid process, the pain produced by such a lesion being not necessarily confined to the ear.

*Aural Polypi.*—Aural polypi occurring in cases of chronic suppuration frequently recur after removal. Fraser and Young[11] have considered how far the removal of such polypi is advantageous. They point out that accidents are recorded, apparently the three most serious risks being the occurrence of facial paralysis, meningitis, or post-operative hæmorrhage. Facial paralysis is probably due to the nerve lying exposed in the tympanic wall, and the greater proportion of cases will recover. Meningitis is most frequently due to the extension of infection from an infected labyrinth, the existence of this infection not having been recognized before operation. They conclude that the removal of polypi is advisable provided certain precautions are taken in the selection of cases. No case should have the polypi removed in which there are any acute symptoms, such as earache, headache, tenderness, giddiness, vomiting, shivering, etc. Operation should only be performed if the labyrinth be found to be healthy on functional examination, and under conditions in which it will be possible for the patient to have efficient antiseptic treatment after operation. It is also well to institute a short period of such treatment before operation to minimize the risks of complications. Where removal of the polypi is contra-indicated, a radical mastoid operation should usually be performed.

*The Radical Mastoid Operation.*—One of the great practical disadvantages of this operation for the cure of chronic suppuration is the prolonged after-treatment which is usually necessary while epithelialization of the cavity is taking place. The success or otherwise of the operation depends to some considerable extent on the skill with which this after-treatment is carried out. To shorten this period, various methods of skin-grafting have been used for many years. This grafting can either be carried out at the time of operation, or after an interval of a week or more, when the cavity is lined by granulation tissue. The former method avoids a second operation and, where successful, saves time, but the chances of the graft taking are not quite so good. The greatest technical difficulty in employing either the early or later graft consists in ensuring accurate apposition of the graft to the cavity, and its maintenance in position. To facilitate this, White[12] has employed the method of 'epithelial inlay', which was extensively employed in other directions in war surgery. The cavity is first prepared by irrigation with saline, and, if necessary, the curetting of redundant granulations. It is then filled with dental compound (stent), which has been previously softened in hot water to render it sufficiently plastic. If over-heated it becomes sticky. In a few minutes, when the compound has set, it is removed. The cast of the cavity thus produced is carefully covered with a Thiersch skin-graft with the cut surface outermost. Cast and graft are then replaced, thus ensuring perfect contact and, owing to the filling of the cavity, preventing an accumulation of discharge. The cast is removed at the end of a week, either through the meatus or through the retro-auricular incision, which has been left open for the purpose.

*Zinc Ionization after Mastoid Operations.*—The employment of zinc ionization in the treatment of chronic middle-ear suppuration, as advised by Friel, was dealt with in the MEDICAL ANNUAL of 1922, p. 114. Wells,[13] as an extension of this idea, has employed the same technique in the post-operative treatment of patients on whom mastoid operations have been performed. He finds as a result that this considerably expedites healing.

*Conservative Mastoid Operations.*—The preservation of any portion of the structure of the middle ear which might function in the retention of the greatest possible degree of hearing is a surgical ideal. Various types of conservative mastoid operation which have this object in view have been practised for many years, but, owing probably to their employment in unsuitable cases, they have not obtained their due recognition. Watson[14] has analysed the results of 84 cases on which this type of operation had been performed, and compared the results with those obtained from the radical operation. Indications which led to the choice of this operation, in preference to the radical one, were the presence of reasonably good hearing in the affected ear, and deafness in the other ear rendering it important to preserve the maximum degree of hearing. The operative technique observed was similar in the two types of operation, except that in the conservative operation the bridge and middle ear were left intact in the great majority of cases. He found that while the radical operation did undoubtedly give a higher proportion of dry ears after operation, the hearing was very much better in the cases in which the middle-ear structures had been left intact, and he comes to the conclusion that a conservative operation has a definite field. Bárány[15] in some cases extends the conservative operation further, removing the bridge, exposing the attic, and excising the head of the malleus and sometimes the incus. The true position seems to be that, where it is decided to preserve any portion of the middle-ear structures, the degree to which they are left must be varied to suit the individual case.

## INTRACRANIAL COMPLICATIONS OF EAR DISEASE.

*Meningitis.*—In cases of meningitis secondary to aural suppuration, the question of the nature and extent of operation is difficult to decide. While the prognosis in these cases is very bad, a number have recovered after operation, and early diagnosis should produce improved results in the future. Davis[16] gives what may be regarded as the view of the majority of surgeons on this point. In cases of acute purulent streptococcal suppuration of the mastoid, with symptoms of labyrinthine origin—that is, vomiting, vertigo, nystagmus, etc.—a lumbar puncture should be performed, and, at the same sitting, the mastoid opened up and the drum incised. If the labyrinthine symptoms are not subsiding in forty-eight hours and the cerebrospinal fluid shows a leucocytosis, a radical mastoid and simple opening of the labyrinth through the promontory and a second lumbar puncture should be done. Failing improvement, if signs of meningeal infection develop, the posterior cranial fossa should be drained through the internal auditory meatus and in front of the lateral sinus. Eagleton[17] is of the opinion that leucocytosis of the cerebrospinal fluid in a case of aural suppuration with meningeal symptoms is a sign that the tissues are reacting. In the presence of such a leucocytosis and the absence of organisms from the cerebrospinal fluid, there is a reasonable chance of cure if the aural focus be thoroughly dealt with. In cases in which organisms are present in the fluid the outlook is very bad, and the only hope consists in dealing with the aural lesion combined with repeated lumbar punctures or subarachnoid irrigation. Ballance[18] suggests that it might be advisable sometimes in cases of aural meningitis to attempt free drainage of the subarachnoid space through an occipital opening, without interfering with the focus in the ear, so as not to prolong the operation unduly. The general opinion, however, is in favour of dealing with the primary focus as being the more important factor in the treatment.

*Lateral Sinus Thrombosis.*—Opinions differ as to the indications which call for ligation of the jugular vein in cases of lateral sinus thrombosis. Rott[19] ligates under the following conditions: (1) In the presence of metastases or when the jugular vein is obviously thrombosed; (2) When, on the lateral sinus being opened, there is no bleeding from the lower end; (3) When rigors and fever continue or reappear after operation on the sinus, even though at operation free bleeding took place from the lower end.

## HEREDITARY SYPHILIS OF THE EAR.

The frequency with which the ear is involved, with resulting deafness, in cases of congenital syphilis, is very high. The tendency has been to regard the occurrence of deafness as more or less inevitable: but it is possible that earlier diagnosis and efficient treatment may produce better results. In the past, frequently, when first seen, so much damage had already been done to the hearing that treatment was unavailing. The importance of this subject is rendered greater by the fact that a proportion of cases of deaf-mutism are due to damage to the ears by this infection in infancy. Parrel[20] emphasizes this fact, and points out that the first manifestations of the disease in infancy are very frequently found in the nasal passages. It is probable that efficient treatment of the infant, if the case is diagnosed sufficiently early, will prevent subsequent deafness. Ramadier[21] and Hennebert[22] deal fully with the signs and symptoms presented by those cases in which the ear is affected. The onset of deafness usually takes place between the ages of ten and twenty years; but a case has been described in a patient as old as twenty-eight years. Signs of past interstitial keratitis are usually present. The destruction of hearing is due to a rapid, extensive, diffuse, and bilateral destruction of the functions of the labyrinth, without any evidence of disease in the middle ear. Subjective vertigo may be present in a slight degree, but is not a prominent symptom. The lesion is usually localized to the labyrinth, in contradistinction to the nerve deafness of acquired syphilis, in which frequently neuro-meningeal changes are the cause, and other evidences of affection of the nervous system are present. *The pseudo-fistula sign of Hennebert* is present in a considerable proportion of these cases of congenital syphilis of the labyrinth, but is not found in acquired syphilitic nerve deafness. This sign resembles in type the true fistula sign which is found in cases of fistula of the semicircular canal, owing to erosion of the bone in chronic suppuration. The pseudo-fistula sign differs, however, in that the middle ear is normal and that the eye movements produced are the exact converse of those obtained in the true sign. Thus, in the pseudo-fistula sign, on compression of the air in the auditory meatus, either a slow deviation of the eyes towards the side compressed is produced, or a nystagmus to the opposite side. These eye movements, as in the true fistula sign, may be accompanied by a deviation of the head, or vertigo and nausea. This sign indicates a lesion of the labyrinth, and the fact that it is generally found in cases of congenital syphilitic deafness, and only rarely in cases of acquired disease, shows that in the former the damage is situated in the labyrinth, but in the latter more usually in the nerve. In these congenital cases, the rotation test is usually negative and the caloric test diminished. Didier[23] suggests that these patients will occasionally react to treatment, even if the deafness has commenced. He relates a case in which, as a result of vigorous antispecific treatment with arsenical preparations, the hearing in the ear which had been most recently affected improved considerably; but, on the other hand, the other ear, in which the deafness was of longer standing, was uninfluenced. [I have myself obtained improvement in cases in which the deafness was recent and partial in degree, and suggest that treatment is very well worth while. On the other hand, it is even more essential to institute treatment before any deafness has taken place, as the labyrinthine destruction is so rapid.—A. J. M. W.]

## VESTIBULAR SHOCK.

In cases presenting a classical Ménière syndrome, due to labyrinthine irritation or disease, both segments of the apparatus are involved, some degree of deafness and tinnitus accompanying the vertigo, vomiting, etc. Trautmann,[24] under the title of vestibular shock, describes cases differing from the classical Ménière, in that the lesion is confined to the vestibular apparatus. In a typical case there is a period of brief unconsciousness, accompanied by vertigo and vomiting. Cases examined within two hours of the attack showed the labyrinth to be in a state of abnormal excitability, which, however, passed off in a short time. He suggests that the condition is of an angioneurotic nature, and in such cases search should be made for other similar lesions, i.e., urticaria, etc., elsewhere. The rapid recovery negatives the occurrence of a labyrinthine hæmorrhage or thrombosis.

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## ECLAMPSIA. (*See* Pregnancy, Disorders of.)

## ECTOPIC PREGNANCY. (*See* Pregnancy, Disorders of.)

## ECZEMA. (*See also* Skin Diseases, General.)

*E. Graham Little, M.D., F.R.C.P.*

O'Keefe[1] has made a study of eczema in young children from the point of view of food sensitization. He found in a series of 41 solely breast-fed infants that 60 per cent showed protein sensitization, 40 per cent to egg proteins, 39 per cent to cows'-milk protein, 5 per cent to oats, and 2 per cent to wheat. Since these children had had no food except breast milk, it must be assumed that the breast milk contained foreign proteins to which the sucklings became sensitized. The task of the physician is to eliminate these from the mother's dietary. With this treatment very satisfactory results were obtained.

Wright[2] also emphasizes the importance of supervising the diet of breast-feeding mothers, inasmuch as it has been demonstrated that egg-albumen may be present in the milk after quite moderate maternal egg-eating, and other agents of sensitization may also pass in the same way. The barley of the diluting barley-water may be the factor in some cases.

References.—[1]*Jour. Amer. Med. Assoc.* 1922, Feb. 18, 483; [2]*Canad. Med. Assoc. Jour.* 1922, Jan., 12.

## ELECTROTHERAPEUTICS. (*See also* Radiotherapy *and* X-ray Diagnosis.)

*C. Thurstan Holland, Ch.M.*

**Diathermy.**—Those who wish to obtain a general knowledge of the scope of diathermy should read a lecture given by Cumberbatch[1] which deals with the subject in a general form. Commencing with a discussion on the nature of the diathermy current, there follow remarks on the physical and physiological properties of high-frequency currents, and finally the author deals *in extenso* with the therapeutic uses. This portion divides itself into two parts, the first of which describes the results which can be obtained by the heating effects, and the second considers the uses of diathermy in the destruction of abnormal tissues. There is a large amount of practical information throughout this paper. Thomson-Walker[2] purposes to enumerate some of the conditions met with in *genito-urinary practice* which are specially amenable to diathermy treatment. The conditions he deals with chiefly are papilloma of the bladder, gonococcal infection, hypertrophy of the prostate, and vesical and ureteral calculi. When a ureteral calculus is causing a swelling projecting into the bladder in the course of the intermural ureter, the author cuts a linear groove by diathermy through the anterior wall of the sac until the calculus is reached. This releases the stone, which passes into the bladder. Calculi incarcerated in diverticula of the bladder can be dealt with in exactly the same way.

**Ultra-violet Rays.**—Hazen[3] has used these for the treatment of *x-ray telangiectasis.* He has treated 8 cases; of these, 3 were slight ones following on the use of radium, 3 mild scattered lesions following *x*-ray treatment for acne, and 2 were large areas covering the whole thyroid and thymus areas. The Kromayer lamp was used because of its known effect in producing an obliterating endarteritis, and gave very encouraging results. Using a quartz compression lens, an exposure of fifteen to twenty minutes was given to each area, and in no instance were more than two treatments necessary to obliterate all the vessels in an area treated; but whilst the telangiectases disappear, the skin remains unchanged.

Burroughs,[4] using the tungsten arc—he describes his apparatus—has had much success in the treatment of *superficial suppuration.* The chief point of this paper, however, is to indicate the results obtained in *ear conditions,* such as chronic otitis media with deafness. Typical cases are quoted, giving the exact details of the treatment and the results; the deafness in all cases was considerably improved.

**The Constant Current.**—Friel,[5] in a short paper, takes up the question of the uses of the constant electric current in treatment, but his chief purpose is to discuss the reasons of success in some cases and failure in others; additionally, some of Leduc's experiments are illustrated and elaborated. As regards actual treatment he deals with *chronic suppurative otitis media* and the results to be obtained by *zinc ionization*; illustrative cases are quoted, and it is to be noted that all cases of polypi, granulations, and mastoid disease are considered as unsuitable. The same author in another paper[6] on the same disease—chronic otorrhœa in children—definitely lays down the class of case in which success is probable, and the conditions which have to be dealt with by other means before zinc ionization can effect a cure. Of 102 cases considered to be due to tympanic sepsis, 83 were known to be cured, and of these, 58 were cured with one treatment. In an address on otitis media, Sharpe[7] states that for chronic otorrhœa limited to the tympanic cavity no method gives results in any way comparable with those obtained by zinc ionization; and it is not unusual to see the ear of an adult, which has suppurated continuously from childhood, cease to do so after one treatment. He also considers that in most instances the hearing is improved, in many cases markedly so. In a further paper, Friel[8] discusses zinc ionization in the treatment of *suppuration in the mastoid, frontal, and sphenoidal sinuses,* with special reference to the question of technique. This is carefully described in all detail, a special point in each case being made of the position of the patient in order to ensure perfect contact of the solution with the diseased surfaces; the dosage is also indicated. It is very essential that in all these cases—ears and sinuses—the essential principles which lead to success should be thoroughly understood. These are to be found, tersely put, in a letter by Jobson.[9] He lays down very clearly the essentials for success, the cases in which the treatment is indicated, and the conditions often present which make success impossible.

Russ[10] reports on his results in 500 cases of *gonorrhœa treated by electrolysis,* in a paper in which he in the first place records his technique in detail. Discussing the complications, the author states that there is unaccountable immunity from arthritis and fascial complications; that he has had no cases of ophthalmia or stricture; but that epididymitis, on the other hand, has been encountered. The length of the treatment and the number of treatments usually required are reviewed; chronic cases appear to vary considerably, but the ordinary acute case should not require more than twelve treatments.

**Electrotherapy in Gynæcology.**—Zimmern[11] considers that many circumstances of late have somewhat unfortunately tended to put electrical methods at a discount in the treatment of gynæcological affections. His paper is a plea for the reconsideration of electrical treatment in many of these conditions, and it is based very largely upon his personal experience. A considerable number of ailments, such as *metritis, dysmenorrhœa, amenorrhœa,* congenital and acquired *strictures of the cervix,* etc., are considered, and the methods of applying electrical treatment for each are described. Those who practise this method of treatment will find much useful information in the paper.

**Polar Reversal in Muscle Testing.**—Cumberbatch[12] calls attention to the difficulties which sometimes arise amongst cases of paralysis in deciding upon the question of the reaction being abnormal or not, and considers that polar reversal will sometimes supply the only certain indication. In a short note he describes the cases which may be doubtful, and the method of obtaining the reaction by polar reversal, which may be decisive.

**Death from Electric Shock.**—Four interesting and valuable papers by Legge,[13] Scott Ram,[14] Levy,[15] and MacWilliam,[16] deal with the very important question of the cause of death in those rendered insensible by electric shock, the pathological changes produced, and the proper treatment to be adopted. These papers are largely occupied with the causes of death; whether respiratory failure or ventricular fibrillation is the actual cause, and if so, what is the proper treatment. It appears to be certain that in a large number of cases death is actually caused by ventricular fibrillation, and notwithstanding this it seems certain that in all cases *artificial respiration* should be immediately resorted to. This is more especially the case as, according to MacWilliam, the only active remedial measure that has been found useful in ventricular fibrillation so far, namely massage of the heart through the diaphragm after the abdomen has been opened, is obviously not available under the conditions in which electric shock occurs.

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## ENCEPHALITIS, EPIDEMIC. (*See also* EYE AFFECTIONS.)

*J. Ramsay Hunt, M.D.*

### THE STRIATAL AND THALAMIC TYPES.

Ramsay Hunt[1] considers the symptoms and syndromes referable to the basal ganglia in epidemic encephalitis. The disease has given rise to a number of rare and interesting symptoms which are largely due to the peculiar nature of the virus and its localization in parts of the nervous system not usually involved. It is not unlikely that the toxic agent possesses a special affinity for certain cellular neurons, thus producing some of the striking clinical results which have been noted. Of these clinical manifestations, those related to the corpora striata have aroused, perhaps, the greatest interest. This is due, partly, to the recent advances in our knowledge of the function of these structures, but also to the extreme rarity of this localization in other types of inflammatory disease. No other acute affection of the central nervous system has yielded so many and such striking evidences of involvement of the great basal ganglia as encephalitis lethargica. While the optic thalamus is frequently involved in encephalitis, the thalamic symptoms are milder and less serious than are those of the striatum, and the chief emphasis of this study is placed upon the latter.

**Striatal Types of Epidemic Encephalitis.**—During the recent epidemic, all of the symptoms which we commonly associate with affections of the corpus striatum have appeared in one form or another. These manifestations have been slight or severe, transitory or progressive, general or local. In addition, many bizarre and fragmentary motor manifestations have been observed which were probably also of striatal origin. Hunt's personal experience is based on the study of 25 cases in which evidences of striatal involvement were present at some period of the disease.

Modes of Onset.—Symptoms referable to the corpus striatum occur very frequently in the acute stage of the disease, and are evidently associated with an early localization of the inflammatory process in this region. They may also appear at a later period after all acute symptoms of the disease have subsided. Very remarkable is the appearance of striatal symptoms as late sequelæ, weeks or even months after apparent recovery, suggesting a recrudescence of the infectious process.

Symptoms.—Striatal symptoms are of two types, corresponding to the two chief syndromes of the corpus striatum. There is a *paleostriatal* or *pallidal type* characterized by paralysis agitans, and there is a *neostriatal type* characterized by choreiform movements. While these two clinical syndromes may appear in pure form, there is often an admixture of the two, as a result of which many curious clinical pictures are produced. The *mixed striatal type* is characterized by a combination of the symptomatology of both paralysis agitans and chorea, a *mixed paralysis-agitans-choreiform type*. Of the two, the paralysis agitans type is the more frequent, and usually the more severe in its manifestations. This is probably due to the course and relations of the pallidal system, and the closer proximity of the paleostriatum to the mid-brain, which is the chief centre of the inflammatory area. Of the 25 cases which came under his personal observation, 18 were of the paralysis agitans type, 4 of the choreiform type, and 3 mixed striatal types.

*Paleostriatal or Pallidal Type (Paralysis Agitans Type).*—The paralysis agitans type is characterized by a fairly acute involvement of the voluntary musculature. Within a brief period of two or three days there develop the typical muscular rigidity, postural deformities, mask-like expression of the face, and the paralytic disturbances of motility characteristic of paralysis agitans. Generally speaking, the tremor is much less constant, and when present is less conspicuous, than in true paralysis agitans. This is probably caused by the sudden development of massive rigidity which masks the tremor, producing the clinical type known as *paralysis agitans sine tremore*.

One side is frequently more affected than the other, and *hemilateral types* are encountered in a late stage of the disease. Even more limited forms occur (*segmental types*), as, for example, isolated involvement of the face (the Parkinsonian mask). Involvement may also be limited to the upper or lower extremities. The segmental types he has only observed after the subsidence of the acute stage as a late residual manifestation. The tremor may show a similar limitation, and typical rhythmical tremor may be hemilateral or sometimes segmental, i.e., confined to the head, an arm, or a leg. These fragmentary clinical types are usually encountered only as late or residual symptoms.

*A cataleptic type* has also been described. The association of general muscular rigidity of paralysis agitans type with the peculiar lethargy characteristic of the epidemic encephalitis produces a clinical picture closely resembling catalepsy (flexibilitas cerea). And while true catalepsy has been observed during the course of the epidemic, many cases of so-called cataleptic type probably belong to the paralysis agitans group and are of striatal origin.

*Abortive types.*—It is also interesting to note that, in the acute stage of the disease, mild transitory striatal symptoms are sometimes present. These consist of a certain tightness or tenseness of the musculature, and a certain monotony and mild fixity of expression, with slight tremors of the tongue, face, or extremities, which disappear as the acute symptoms subside. Cases of this type do not, however, always abort, and these initial symptoms may be the forerunners of more serious striatal involvement.

*Progressive type.*—A tendency to progression in the paralysis agitans group is not uncommon. In his experience this tendency has been greater in those cases in which the symptoms make their appearance late in the disease, or as relapses after improvement or apparent recovery. It would appear to depend upon a renewal of the inflammatory process or an actual lighting up of old lesions. A *relapsing* form, unfortunately not uncommon, is a well-recognized type of the disease.

*The Neostriatal Type (Choreiform Type).*—The other essential syndrome of the corpus striatum which may develop as a result of epidemic encephalitis is chorea. The choreiform movements of striatal origin are involuntary and irregular in character, and are of the automatic associated type. According to the view which the author has already expressed, they represent a motor discharge of the striatal mechanism, in contrast with paralysis agitans, which is a paralytic manifestation. The *choreic movements* may be general, hemilateral, or segmental (local) in their distribution. They also vary somewhat in character, e.g., mild and severe, of large and small amplitude, and occasionally rhythmical. A certain degree of hypertonicity is sometimes present, giving an athetoid character to the movement. Athetosis or choreo-athetosis he would regard as an admixture of chorea and muscular rigidity due to involvement of both the neostriatal and pallidal systems.

*Acute choreiform type.*—Some writers have described cases characterized by generalized choreiform movements appearing in the acute stage of the disease, associated with delirium and other severe psychotic symptoms—a clinical picture very similar to the *chorea insaniens* of systematic writers.

*Choreo-athetoid types of movements.*—In addition to chorea, movements of an athetoid and *choreo-athetoid* type may also occur, both in the early and late stages of the disease. Of special interest is their appearance as late sequelæ months after apparent recovery. The movements of this type, like those of chorea, may be general, unilateral, or segmental (local) in distribution. They differ from chorea in being slower, more stereotyped, and associated with hypertonicity of the affected muscles.

*Rhythmical chorea (Bradykinetic Oscillation).*—This varies somewhat from the recognized lenticular types. It is characterized by slow rhythmical movements of an extremity, sometimes involving both the arm and leg on the same side, and occurring with great regularity—eighteen to twenty movements to the minute. With the slow rhythmical oscillation of the extremity there is a simultaneous hardening of many of the muscles of the arm or leg, showing the diffuse nature and wide distribution of the muscular contractions.

*Mixed Striatal Type (mixed Choreiform and Paralysis Agitans Types).*—While the paralysis agitans and choreiform types may occur in pure form, it is well to note the fact that these two clinical pictures are not infrequently combined in greater or lesser degree. Indeed, among the most striking features of involvement are the many bizarre combinations which unite both the elements of chorea and paralysis agitans.

*Rare Myoclonic Types.*—Occasionally one observes stereotyped rhythmical movements of the distal portion of the extremities, after an attack of encephalitis. In one of these cases, which presented typical symptoms of paralysis agitans, there was rhythmical flexion of all the fingers, occurring about twenty times a minute. Movements of this type are so fragmentary that it is rather difficult to localize them with certainty. The association with paralysis agitans and the stereotyped regularity of the movement are in favour of a striatal origin.

**The Thalamic Type.**—The optic thalamus is the sensory counterpart of the corpus striatum. Lesions in this region may produce sensory symptoms of the following character: spontaneous pain of intolerable intensity and of persistent character; loss of superficial and deep sensibility, with anæsthesia; ataxia and astereognosis. There may also be present slight hemiplegia, as well as choreic and athetoid movements. The sensory loss and pain are alone of thalamic origin; the other symptoms are referable to surrounding parts. The most frequent symptom of thalamic involvement in encephalitis, in his experience, has been pain. This may be of agonizing intensity, and is very resistant to all analgesic remedies. It may be generalized or localized, and may persist for weeks or months. It is difficult to differentiate localized thalamic pains from those referable to the posterior grey matter and posterior root system of the spinal cord. In no case has he encountered any extensive anæsthesia, either superficial or deep. Tactile sensation has shown little or no involvement; and the chief sensory disturbances, when present, have been of pain and temperature sensibility. In no case was the deep sensibility affected.

## EPIDEMIC ENCEPHALITIS IN CHILDREN.

J. Neal,[2] of the Department of Health of New York City, reports her experience with more than one hundred cases of *epidemic encephalitis in children.* The symptoms do not differ greatly from those in adults. A rather larger percentage show a sudden onset, and the course of the disease is ordinarily shorter, than in adults, although the mortality is approximately the same. The symptoms comprise both those of a generalized infection, such as fever, headache, vomiting, constipation, and malaise, and those more directly referable to the central nervous system. The latter show an almost endless variety. Lethargy was a prominent symptom in many of the cases: the term 'lethargic' was earlier used in describing the disease. This, however, is by no means a constant symptom. Indeed, insomnia is an equally striking phenomenon in many cases, and in some patients both conditions may be present at different times. Convulsions are common, especially in younger children. In many cases delirium is present.

Ocular disturbances are of very frequent occurrence and of wide variety, including diplopia, blurring of vision, blindness, ptosis (either unilateral or bilateral), strabismus, nystagmus, and occasionally peculiar motions of the eyes. Paralyses of wide distribution may occur. The cranial nerves are more often affected. Facial paralysis or paresis, either unilateral or bilateral, is often present, and probably causes the mask-like expression so often noted. In some instances the neck muscles have been affected; in one case this was unilateral. Inability or unwillingness to swallow may occur to such an extent as to make tube-feeding necessary. Disturbances of speech are not uncommon. Twitchings, either general or localized, are a very common phenomenon. They vary from a fine tremor to choreiform movements. Catatonia is not infrequent. The reflexes show all varieties of change. They may be increased, decreased, lost, equal, or unequal. The Babinski sign and ankle-clonus are not uncommon. Retention or incontinence of urine occasionally occurs. Constipation is often obstinate. Profuse sweating is fairly common. The more typical meningeal symptoms, such as stiffness of the neck and the Kernig sign, are not common unless associated with some degree of general spasticity. The course of the disease varies greatly—from two or three weeks to many months. The prolonged cases, lasting several months, are less common in children than in adults.

The blood-count in epidemic encephalitis varies from normal to one showing a moderate degree of leucocytosis, perhaps up to 15,000 or 20,000. Blood cultures are sterile. The urine is negative or shows a mild degree of nephritis common in acute infectious conditions. The examination of the spinal fluid throws more light on the subject than any other laboratory procedure. The fluid presents practically the same picture as in poliomyelitis; it is clear, and usually increased in amount. A web rarely forms. The cell-count may sometimes be normal. It is usually moderately increased, ordinarily to no more than 100 to 150, though in one case it ran as high as 1500. The mononuclears usually predominate; but, as in poliomyelitis, the fluid may in rare instances be slightly blood-tinged, probably indicating a more than usually severe hæmorrhagic process. The albumin and globulin are increased, usually slightly to moderately. The glucose, as measured by the qualitative reduction of Fehling's solution, is normal.

## SEQUELÆ.

On account of the great interest centering around the sequelæ, adults as well as children were included. They seem to develop more frequently in adults than in children. Up to the end of March, 63 cases, or 39·3 per cent, of the recovered cases, showed sequelæ for varying lengths of time after the subsidence of the acute symptoms. In these cases, 21 patients were less than fifteen years old, and 42 were adults. Like the symptoms, the sequelæ are also varied. In a general way they may be loosely classified as: Weakness or paralysis: adults, 8; children, 4. Tremor, choreiform movements, spasm: adults, 6; children, 3. Pains in body or limbs: adults, 2. Headache: adults, 8. Dizziness: adults, 3. Nervousness: adults, 5: children, 6. Change in disposition: adults, 1; children, 3. Insomnia: adults, 3; children, 2. Drowsiness: adults, 1; children, 3. Speech defects: adults, 6; children, 3. Defect of eyes: adults, 9; children, 4. Change in mentality: adults, 14; children, 10.

The sequelæ of acute epidemic encephalitis are considered by Grossman,[3] based on a study of 92 cases from one to three years after recovery. As a result, the following tentative prognosis was offered: Probably less than 20 per cent of the patients who become ill with acute epidemic encephalitis die during the acute stage of their illness, as only the most severe cases as a rule reach the hospital. Of those who survive the acute stage, about 10 per cent may develop a progressive disease of the central nervous system.

The remainder will make a good functional recovery in from six to twenty-four months after the acute infection, with the probability of progressive approach to the normal after that period. Unfortunately, this rather hopeful outlook has not been substantiated by further observation of these patients.

Among the 92 cases, there were 10 patients who had recovered completely; 14 others had recovered sufficiently to permit them to return to their work. Among these 14 were 4 who showed only facial asymmetry; 6 had facial asymmetry in addition to other residual signs pointing to their cranial nerves; the remaining 4 exhibited disturbed cranial nerve innervation and a spontaneous tremor of the tongue, facial muscles, or the extremities. All but one of these patients still complained of psychic disturbances, such as insomnia, irritability, depression, or headache. Two of them were afraid to stay in the house alone. In 2 patients the physical findings have remained stationary since their examination one year ago. Four others, although still far from being well, have shown some improvement since their last examination. One of these still shows bilateral pyramidal tract involvement, and difficulty in swallowing fluids. Two patients in this group still have unequal pupils, with sluggish reactions to light, and in addition they have a spontaneous tremor in the right hand. The fourth shows partial ptosis of one lid, speaks in a monotonous voice, and has a spontaneous tremor of the paralysis agitans type in both hands.

The remaining 62 all showed a serious and more or less progressive involvement of the central nervous system: 42 of them presented a clinical picture which closely resembled that of paralysis agitans.

References.—[1]*Amer. Jour. Med. Sci.* 1921, Oct., 481; [2]*Jour. Amer. Med. Assoc.* 1921, July 9, 121; [3]*Ibid.* 1922, April 1, 959.

## ENDOCARDITIS, SUBACUTE BACTERIAL.

*Dr. C. Lian.*

*(Translated by Carey F. Coombs, M.D., F.R.C.P.)*

Treatment.—The clinical picture and the lesions of this type of endocarditis are now familiar, and among recent contributions may be mentioned that of C. F. Coombs,[1] who believes that not only these cases but also those of rheumatic carditis are streptococcal in origin. The outlook is still gloomy, and treatment ineffective; but one or two new attempts at treatment are worthy of notice. F. D. Boyd,[2] in an article on this subject, reports the case of a patient treated with three injections of 20 c.c. of her own serum in three consecutive days. With the beginning of these injections the condition appeared to improve, and at the end of three weeks she was discharged, apparently cured.

On the other hand, G. F. Dick[3] has used injections of serum, or whole blood, from a healthy subject immunized by a vaccine prepared with the streptococcus isolated from the patient's blood.

In one case the patient's husband received on three consecutive days injections of ½, 1, and 2 billion organisms killed at 57° C. On the seventh day following the last injection 50 c.c. of blood was withdrawn from the donor; 20 c.c. of serum was collected and given the patient intravenously, and four days later, 25 c.c. of whole blood from the husband was given to the patient subcutaneously. The same treatment was repeated. No effect was noted from these injections.

In the meantime the patient's sister was immunized by 1, 2, and 3 billion heat-killed organisms, then one week later by 2, 3, and 5 billions. Eight days afterwards, 25 c.c. of blood was withdrawn from the sister's arm and immediately injected into the arm of the patient. This procedure was repeated on the second, third, and fifth days following. The patient felt much better, and many symptoms pointed to a real improvement; but two days after the last injection the patient died suddenly. In another case, similarly treated, Dick noted an improvement during the course of the treatment.

References.—[1]*Quart. Jour. Med.* 1922, Jan., 114; [2]*Edin. Med. Jour.* 1921, Sept., 129; [3]*Jour. Amer. Med. Assoc.* 1922, April 22, 1192.

## EPIDERMOPHYTOSIS.

*E. Graham Little, M.D., F.R.C.P.*

Ruggles[1] has devised the following formula which he has used with great satisfaction in this condition, especially affecting the toes: zinc oxide 6 parts, tar ointment 22 parts, phenol 1 part, ointment of rose water 18 parts. This is applied twice a day, and, when the eruption has subsided, the following lotion should be used for some time after the skin seems to be quite normal: salicylic acid 0·65 grm., tannic acid 3 grm., alcohol 30 grm. Or this lotion may be even more effective: tinct. iod. 4, spt. camph. 28 parts.

White and Greenwood[2] divide the clinical manifestations of this disease into the following typical classes: (1) macular, (2) vesicular, (3) macerated, (4) hyperkeratotic, (5) papular, (6) nail infections. (1) The first class is better described as eczematoid, and the commonest site is the upper part of the thigh—not the groin, which these authors consider an unusual position, and consequently deprecate Sabouraud's title, epidermophyton inguinale. Men were affected four times more commonly than women. One personal observation is recorded in the scalp, where the disease is rare. The hair follicles were dilated, and surrounded by inflammatory elevated tissue, not scaly. In parts of the diseased area there was a papery exfoliation. The axillæ and submammary region in women are favourite sites. (2) The vesicular type is limited to hands and feet, and is especially difficult to distinguish from infective eczematoid dermatitis, which also produces these grouped vesicular rashes. The authors combat the proposition that this type is more common in hot weather. (3) The macerated type has usually a secondary pus infection masking it, and is best seen between the toes, especially the fourth and fifth. The intergluteal fold is another position where it is commonly seen, starting well behind the anus, and running up to the uppermost gluteal boundary. Itching is very severe in this variety as a rule. (4) The hyperkeratotic type is commonest on the palms and soles, and especially on the ball of the foot. (5) The papular type is the least common, and is difficult to differentiate from lichenification from other causes, without help from more characteristic lesions. Lastly, the disease may attack the nails, but not the hair, and is often associated with paronychia.

TREATMENT.—The authors recommend painting on **Crude Coal Tar** in moist cases, or 5 per cent tar diluted with **Zinc Paste** when the skin is delicate, e.g., in the anal fold. Fomentations for fifteen minutes twice a day with 1–5000 **Potassium Permanganate Lotion** is highly recommended. Or these prescriptions may be tried:—

| | | | | |
|---|---|---|---|---|
| ℞ | Phenol | 65 c.c. | Ung. Picis Liq. | 10 grm. |
| | Zinc. Oxid. | 6 grm. | Ung. Aq. Rosæ | 20 grm. |
| ℞ | Phenol. | 65 c.c. | Spt. Camph. | 25 grm. |
| | Tinct. Iod. | 4 grm. | | |

The ointment should be used first, and, when the acute stages have passed, the wash should be substituted and carried through to the end. It should be remembered that both may prove too strong and must be suitably diluted at first. There are certain rules to follow in all instances. Soap and water are bad always. The affected parts must be kept cool and aerated as much and as frequently as possible; bandaging, if permitted at all, must be kept down to the minimum. No gloves must be worn unless of a sterilizable nature. Woollen gloves, socks, or underclothes must be taboo. One rule, especially, must be enforced: Never stop treatment, even when all visible and appreciable symptoms have ceased. Continue just the same, and in the course of weeks gradually lessen.

REFERENCES.—[1]*Arch. of Dermatol. and Syph.* 1922, April, 462; [2]*Jour. Amer. Med. Assoc.* 1921, Oct. 22, 1297.

## EPILEPSY.

*J. Ramsay Hunt, M.D.*

Observations on the continued use of **Luminal** in epilepsy are reported by Jackson and Free.[1] The objects of the study were: for the purpose of determining the effects on certain types of mental cases, whose post-epileptic furor and confusional state have made them trying hospital problems; to observe the effects of the long-continued use of the drug on epileptic seizures; to observe the effects which might arise after long usage; and to observe the effects of the withdrawal of the drug. Twelve cases were selected in the male and female wards for treatment. Their preliminary observations coincide practically with a number of writers as far as the reduction in the number of seizures, dosage, and absence of untoward effects are concerned. Their conclusions were as follows: That luminal in doses of 1½ gr. daily reduces the convulsion curve. After a period of time the drug loses its effect, and there is a secondary elevation of the convulsion curve. Increased doses reduce again the convulsion curve, but there is a secondary elevation in increased doses, and a distinct elevation on the complete withdrawal of the drug. This is no doubt due to increased tolerance to the drug and the lack of a curative effect. In two of the cases, after withdrawal of the drug, seizures were severe; patients developed status epilepticus and died. Luminal reduces the convulsion curve, but will not completely eliminate the convulsions.

Prolonged use of luminal is not free from danger, and withdrawal of the drug should be carried out with the greatest care and precaution. The degree of post-epileptic confusion and furor was lessened in two cases. Luminal offers temporary relief, but its value in treatment in the custodial epileptic is doubtful, as established tolerance necessitates higher dosage, the continued use and the withdrawal of the same being associated with serious phenomena.

Fox[2] describes the use of **Luminal Sodium.** This is a soluble derivative of luminal, and he has given it in solution, with hot milk or water, in doses of 1 to 2 gr. once a day, usually at bedtime. The dosage is small as compared with that of Continental observers, who consider that 3 to 4½ gr. can safely be given to adults over prolonged periods, provided that the patients are under adequate supervision. For the purposes of investigation, sixteen cases of ordinary epilepsy in children or adolescents were chosen; the patients were all liable to major attacks at fairly regular intervals, and none showed signs of marked mental defect or deterioration. There was a marked reduction in the fit incidence in every case. This uniformity of reaction to the drug places it, he believes, in a category apart from other anti-epileptic remedies. Secondly, the considerable increase in weight that occurred in almost every case can be no mere coincidence. The average increase of the sixteen cases works out at just under 5 lb., and in one case a loss of weight is recorded. As with other drugs, luminal sodium seems to give best results in cases liable to major epileptic attacks; cases with momentary losses of consciousness, or periodic attacks of altered consciousness with automatism, are notoriously inaccessible to drug treatment. Nevertheless, a diminution of momentary attacks is recorded in three of the patients. It is, of course, not claimed that luminal sodium, or any other drug, has any curative effect upon the disease; at best, it only arrests or lessens the frequency of the convulsive attacks.

Luminal has been used by Austin[3] in one group of forty-nine epileptics for fifteen months with daily doses of from 1 to 5 gr. at bedtime. In cases of status epilepticus and mania, it has been used subcutaneously in doses of from 1·05 to 5 gr. (0·1 to 0·3 grm.), or per rectum from 5 to 10 gr. (0·3 grm. to 0·6 grm.). As to results, in some cases the character of major seizures has been replaced by an atypical one, in which there is no tonic or clonic convulsion, but a furor of considerable violence, of irregular body movements, with loss or partial loss of consciousness. In other cases major seizures are controlled or replaced with minor ones in which loss of consciousness is sometimes incomplete. Austin does not herald luminal as a specific in epilepsy.

Luminal is contrasted with **Bromide** by Golla.[4] The total number of cases that have been observed for a period of not less than eighteen months is 125.

They were treated at the Hospital for Epilepsy and Paralysis, at St. George's Hospital, and at the Maudsley Hospital. All of them had been treated by bromides for periods extending from fourteen years to a minimum of six months. Since cases occur in which the mere suspension of bromide treatment may be followed by a period of improvement, in every case bromide treatment was suspended for a short period and the effects noted. In only one case was there a period of remission following suspension of the bromide treatment, and this remission lasted for sixteen days. Two other cases were unaffected by cessation of the bromides, and all the others showed signs of an increased severity of the malady. This sufficiently disposes of the possibility that any amelioration with luminal treatment can be referable to the mere suspension of bromides.

When the results of luminal treatment were collated, it at once became evident that the efficacy of the luminal varied greatly in cases with different degrees of severity. The following groups were divided: those suffering from diurnal fits; those suffering from fits more frequently than four times in a month of thirty days; those with fits occurring between once and four times in a month; those with fits occurring less than once a month; those with fits occurring in bouts of several at a time at intervals of not less than twenty-one days; and, lastly, a small group of cases of traumatic epilepsy, in which the lesion was of several years' standing. All the cases were carefully examined to exclude syphilitic origin.

A study of the results here recorded shows that 36 cases out of a total of 125 were either not improved or deteriorated under luminal treatment, whilst the remainder did better under luminal than under bromide. The cases most beneficially affected by luminal were those with fits occurring at frequent intervals, and the cases least affected were those whose fits occurred in bouts at considerable intervals of time.

The interpretation of these results is a matter of some difficulty; to make the experiment complete it would be necessary to know the frequency with which the fits would have occurred when the patients were observed for lengthy periods in an untreated condition. Golla hesitates to believe that luminal exercises a selective action on those forms of epilepsy in which the fits occur with the greatest frequency. It appears to be more probable that there is a class of epileptics who are more refractory to bromide treatment than others; such a class would obviously show the greatest number of fits when treated by bromides; at the same time these patients are not less susceptible to luminal than their fellows, and consequently it is in these cases that the drug shows its most marked effect.

The drug is, as a rule, well tolerated, and most patients found that they were far brighter and more cheerful after a change to luminal from bromide treatment. In twelve cases, however, the patients complained of giddiness and drowsiness. Five of these patients showed definite affection of the gait, reeling slightly as if under the influence of alcohol. By diminishing the dose of luminal he was able to secure eventual toleration in all but four patients, who complained so persistently of giddiness that the luminal treatment was suspended. Urticarial rashes appeared in two cases at the onset of treatment, but disappeared when it had been continued for a few days. There has in no case been any sign of the formation of a drug habit, and suspension of the treatment has never given rise to any disturbance. There is a tendency in all cases for the number of fits to increase slightly after the first two months of treatment.

REFERENCES.—[1]*Therap. Gazette*, 1921, Dec. 15, 837; [2]*Lancet*, 1921, ii, 558; [3]*Jour. Amer. Med. Assoc.*, 1921, Nov. 12, 1602; [4]*Brit. Med. Jour.* 1921, ii, 320.

## EPITHELIOMA (BOWEN'S). *E. Graham Little, M.D., F.R.C.P.*

Mount[1] tabulates all the cases he has been able to find (which do not, however, constitute a complete list) of reported Bowen's precancerous epithelioma. He objects somewhat unnecessarily to the use of the term precancerous, as prejudging the question whether the disease inevitably becomes epithelioma. The subject is of especial interest at the present time, as cases simulating Bowen's disease, but probably to be differentiated from it, are frequently being reported. Some of the cases in the author's list are probably wrongly described as Bowen's disease. The essential features of this condition are nodular and exudative lesions, with a histology usually indicating some dyskeratosis, such as we find in Paget's disease, and it becomes a moot point whether Bowen's disease is not really a Paget with differences. Mount reports a personal case in a woman of 41, which was probably a true Bowen, but the histological data are very imperfect. The patient had numerous papules and nodules, and larger nummular, slightly scaling patches of a deep-red colour, with here and there crusted nodules which showed on removal of the scab a serous discharging surface, typical of Bowen's condition. The largest of these patches was 1½ in. in diameter, and closely resembled a tertiary syphilide. The sole information given as to the histology is that "it revealed an epithelioma, basocellular in character".

Reference.—[1]*Arch. of Dermatol. and Syph.* 1921, Dec., 770.

## ERYSIPELAS. *E. Graham Little, M.D., F.R.C.P.*

Lesk[1] advocates the use of **Chinosol** in the restriction of the spread of erysipelas, and reiterates the warning that the application should be used for three or four inches beyond the margin of visible erythema. The form in which he uses the drug is thus given :—

| | | | |
|---|---|---|---|
| R Aquæ Dest. (cold sterile) | ʒss | *Rub up, first with* | |
| *Add and dissolve* | | Lanolin | ℥ss |
| Pulv. Chinosol | gr. x | *Finally incorporating* | |
| *Then add* | | Vaseline (white) | ℥ss |
| Sod. Chlor. (reagent) | gr. iv | | |

In parts where an ointment is disagreeable to use, e.g. the scalp, the tincture prescribed hereunder is recommended :—

| | |
|---|---|
| R Aquæ Dest. (10 parts) | ℥iss ♏xlviij |
| *Boil, and make cold in ice-box, then add and dissolve* | |
| Chinosol Powder (2½ per cent) | gr. cxcij |
| *Then add* | |
| 95 per cent alcohol (70 parts) | ℥xj ʒj ♏xxxvj |
| *Shake, and add* | |
| Acetone (20 parts) | ℥iij ʒj ♏xxxvj |
| *Shake, and add without delay, because otherwise a precipitate of chinosol will soon begin to form,* | |
| Sodium Chloride (reagent) | gr. xcvj |
| *Shake vigorously five to ten minutes. A flocculent precipitate will now form which soon redissolves. The insoluble residue is sodium chloride. Let stand over night, and then strain through sterile cotton.* | |

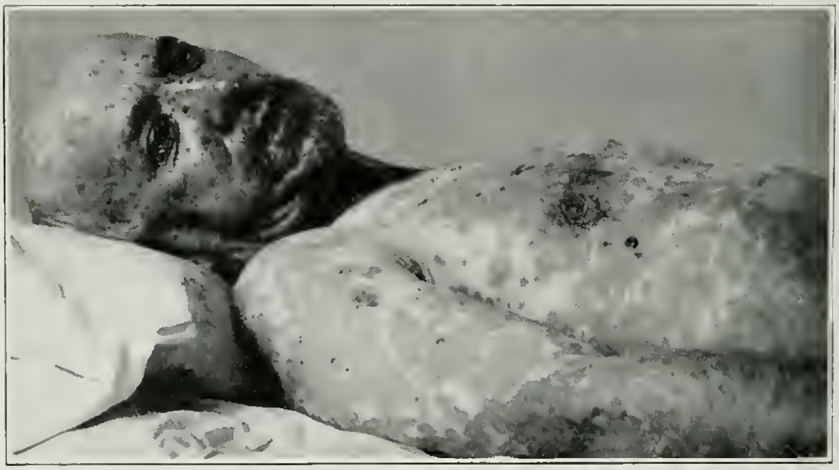
Sig. : Tincture chinosol with acetone and sodium chloride.

The routine treatment consisted in the use of the chinosol ointment for all adult cases of facial erysipelas, and for erysipelas affecting any part of the body in children, and the use of the tincture of chinosol, preceded by a wash of the skin surface with ether, for all adult cases of erysipelas of the scalp, trunk, and extremities. Treatments were administered three times during the day, at four-hour intervals, and twice at night. In cases of facial erysipelas, eyelids which had not swelled were always anointed from the start, just the

# *PLATE XX.*

## ERYTHEMA BULLOSUM

(EISENSTADT)



Showing large discrete lesions coupled with extensive erythematous circinate patches.

*By kind permission of the*
*'Journal of the American Medical Association'*

same as the swollen lids, with the intent to forestall swelling. The ointment is spread on the surface with a wooden spatula. The tincture is painted on the ether-cleansed surface with a camel-hair brush in several successive layers. The cases treated are elaborately tabulated.

Schrader[2] reports seven cases successfully treated with **X Rays**, in doses of one-sixth to one-fourth of an erythema degree. It is not stated if repetition of the application was required, and it is claimed that the inflammation quickly subsides under this treatment.

REFERENCES.—[1]*Ann. of Surg.* 1922, Feb., 143; [2]*Jour. Amer. Med. Assoc.* 1922 April 1, 1012 (abst.).

## ERYTHEMA BULLOSUM.

*E. Graham Little, M.D., F.R.C.P.*

Eisenstadt[1] had the opportunity of studying five cases of severe erythema bullosum, three desperately ill. In all, the chief feature of the eruption was the development of large bullæ, in some cases very widely distributed. In one there were also extensive areas of erythematous circinate patches, ranking the case as an erythema multiforme (*Plate XX*). In two there was pronounced pyorrhœa, and two showed infected tonsils. The fifth case is regarded by the author as the sequel of too vigorous dosing with mercury. The treatment pursued in all the cases was to administer **Sodium Bicarbonate** in doses sufficiently large to ensure alkalinization, and **Salicylates.** When the mouth is affected, these agents are best given by rectal injection.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1922, May 6, 1365.

## ERYTHEMA NODOSUM.

*E. Graham Little, M.D., F.R.C.P.*

The tuberculous causation of this disease has long been sustained by many authors, and P. Pagniez[1] reviews these arguments very fairly. In opposition to this view, he cites the researches of Demieville and his assistant Gueissaz, in the polyclinic at Lausanne. During twenty-one years these observers noted 300 cases of erythema nodosum. Very few of these were seen again for the tuberculous condition, and tuberculous antecedents were not more common in this disease than in non-tuberculous disorders. Jacquerod's experience in the tuberculosis sanatorium at Leysin allowed him to say that he rarely saw erythema nodosum in his patients there. Gueissaz comments on the fact that the disease is three times as common in girls as it is in boys, and that there is a marked seasonal variation, the affection being commoner in spring. This author suggests that it is a contagious disease, and claims to have had eight cases illustrating this quality, in support of which there are several other cases in the literature. The apparent immunity conferred by one attack is a further argument for its contagious character. Many different types of bacteria have been found from time to time in the lesions or in the blood; but there is no accord as to a specific organism, and Brocq's view that erythema nodosum is a syndrome which may have various causes is at present the most widely supported.

REFERENCE.—[1]*Presse méd.* 1922, Feb. 18, 149.

## EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.

*Lieut.-Col. A. E. J. Lister, I.M.S.*

*Arteriosclerosis.*—E. Fuchs[1] calls attention to the importance of ocular lesions as an aid to diagnosis in the early stages of arteriosclerosis (especially of the brain), nephritis, diabetes, and syphilis. He has never found the ophthalmic artery normal after 70 years of age. He has found isolated foci of atrophy in the optic nerve after 70, which he says have not been before described. They are situated in various parts of the nerve, from the chiasma to the entrance into the eyeball. (*See also* RETINA.)

*Diabetes.*—Bourland[2] reports a case of diabetic paralysis of the superior oblique of the left eye. The patient was 55 years old, paralysis persisting for six months. Two years previously there was diplopia lasting only a few days. M. Cohen[3] reports a case of a boy of 14, with diabetes mellitus, lipæmia, and acidosis, associated with a characteristic appearance in the retinal blood-vessels known as 'lipæmia retinitis'. Lipæmia is a condition of increased fatty bodies in the blood; concurrent with the increase of the total fat, there is a rise in the cholesterol content. He believes the extreme hypotony of the globe to be due to a dehydration of the fluid media of the eye, as occurs in other parts of the body. [The reviewer has seen a number of paralyses of the ocular muscles in diabetes. The prognosis is usually good in his experience. He has also been struck by the frequency with which serious retinitis occurs in patients who do not attend to their diet, as diabetes is extremely common in India. This complication, if not quickly attended to, often rapidly damages the vision very seriously, and reduces the state of the patient to a very miserable one. It would be well for the practitioner to bear the possible ocular, as well as other, complications, in mind, when dealing with a refractory patient who will not attend to his diet, as nothing appeals to a patient more than the possible loss of his sight, a danger which, in the experience of the present writer, is a very real one.—A. E. J. L.] (*See also* RETINA.)

*Diphtheria.*—Tiling[4] reports a case of diphtheria of the eye, with ulcers of the conjunctiva and cornea, from which the diphtheria bacillus was isolated. Several other cases similarly affected were discovered by him on careful clinical and laboratory examination. None of the cases showed any nasal or laryngeal diphtheria. Simple local and diphtheritic serum injections cleared up the condition rapidly.

*Encephalitis Lethargica.*—A great deal has been written about encephalitis lethargica. E. F. Buzzard[5] regards the name as unfortunate, because inflammation of the encephalon would produce as many symptoms as there are functions of the brain. He, however, regards diplopia and intellectual dullness as the most common symptoms in mild or ambulatory cases. This does not indicate that the oculomotor nucleus is peculiarly the site of the morbid process, any more than the nucleus of any other nerve, but rather that the slightest defect in the condition of acute muscle imbalance could not be very well overlooked by the patient. J. P. Waaldenburg[6] reports two cases with contraction of the visual fields, 10 to 20 degrees, with enlargement of the blind spots and a ring scotoma including the blind spot. [The ocular complications of this disease are so varied, and occur so frequently, that it is well always to keep it in mind when dealing with an ocular condition for which no cause can be found.—A. E. J. L.]

*Hysterical Affections.*—Hurst defines a hysterical symptom as "one which has been produced by suggestion and is curable by psychotherapy". Abnormal suggestibility is a predisposing cause, but cannot be regarded as a disease; anyone may develop hysteria if the provocation is sufficiently great. He points out that "in order to see, it is necessary to look". Soldiers, in the stupor following exposure to exceptionally terrifying ordeals, would appear to be blind, deaf, and anæsthetic. The pupil contracted sluggishly and there was no motor 'flinch' reflex. A case of shell shock was discharged as permanently disabled, with a pension for total blindness. He lived for four years as a blind beggar, and was found to have pupils widely dilated, with no trace of reaction to light. Treatment by explanation of the condition, promise of cure, and urging the patient to try to see, caused some improvement the same evening, and the next day brought the vision up to $\frac{6}{24}$. Four months later the man was working as a watchmaker and gramophone repairer. Hurst details other interesting cases of hysterical affections of vision, and of blepharospasm and ptosis. In one case of five years' standing, following a wound of the head, there was photophobia, with attacks of headache and loss of consciousness. One day, after full explanation and promise of cure, the patient was able to walk in the sun, without his dark glasses and without headache, and in five months no further attacks had occurred.

*Iritis in Kidney Disease.*—Von W. Gilbert[8] says that a few cases of iritis in elderly people are due to kidney disease. He points out that fibrinous pleurisy and pericarditis occur in this disease, and that the iris is liable to be affected under the same conditions as the serous membranes.

*Puncture of the Lung—Air Embolism of Brain.*—K. Schlaepfer[9] describes a case in which total blindness occurred from an embolism in the brain. The needle used for an exploratory puncture was left open, as the syringe was removed, allowing it to enter a pulmonary vein. The patient was unconscious for two and a half hours, and the blindness lasted for three days.

*Measles.*—F. M. Fernandez[10] points out that measles may cause very grave ocular complications, though these are apt to be disregarded by laymen, and regarded by the physician as only mild symptoms of a general disease. He instances invasion of the cornea with keratitis punctata, as studied by Tranter and by Morax. Sometimes the progress of the corneal lesions is rapid and destructive to the globe. The optic nerve may be attacked. He reports three cases, typical of hundreds of others occurring in benign measles : one patient, age 7, with permanent central macula of cornea, following a virulent pustule ; another, age 1 year, with panophthalmitis from suppurating keratitis during measles ; and another one, a young man, who developed optic neuritis, which rendered vision useless.

J. de Salterain[11] reports that in 426 children with measles and showing ocular disturbances, 55 cases showed ocular affections of the common type, and most of these rapidly subsided with ordinary treatment. In these cases there was severe keratitis, but parenteral injections of milk cured the outstanding symptoms at once.

*Syphilis.*—C. Coutela says that a chancre of the inner canthus in an infant has been taken for dacryocystitis and operated on. He remarks that the diagnosis is easy if one realizes the possibility of acquired syphilis in infants. *Iritis* is the commonest syphilitic ocular manifestation, just as syphilis is by far the commonest cause of iritis in general. Though apt to supervene at the fifth or sixth month, he has seen it as early as a fortnight after the chancre. In a syphilitic subject, traumatism may precipitate an attack of iritis. *Choked disc* is a late manifestation of syphilis. It is an indication of intracranial hypertension which may be caused by syphilis. The symptoms are bilateral, and there are no visual signs at first. The commonest symptoms are fugitive attacks of dazzling or giddiness, and sudden brief attacks of blindness. Sooner or later, in the absence of treatment, vision begins to fail, and the patient may soon retain nothing more than light perception. The immediate symptomatic treatment in a pronounced case is **Decompression**, followed by constitutional treatment. Coutela remarks that inequality of the pupils is a presumption, not a proof, of syphilis. He closes a long article intended for practitioners by saying we must think of syphilis in presence of visual or ocular disturbances, however commonplace, and bear in mind the adage, "Syphilis loves the eye". [Coutela's advice is sound as regards always bearing in mind the possibility of syphilis in eye affections. The reviewer can recall one case in particular, in which it seemed most unlikely and no history was given, because the patient knew him well and said he felt ashamed to tell him. This is apt to be the case with practitioners who know their patients well.—A. E. J. L.]

Hirschberg[13] reports six cases of *glaucoma* in syphilitic individuals in which syphilis may have been the etiological factor. He points out the importance of searching for the disease in glaucoma, because of the favourable influence of general specific treatment.

B. Benavides states that syphilis of the third generation or hereditary syphilis of the second generation is more frequent than is ordinarily supposed. It manifests itself in most cases by ocular stigmata and sometimes a positive Wassermann. He states that *parenchymatous keratitis* of hereditary syphilitics very exceptionally has a negative Wassermann, and its preferable treatment is by **Mercury** and preparations of **Arsenobenzol.**

[There is a marked divergence of opinion as to the value of arsenical preparations in the treatment of the interstitial keratitis of hereditary syphilis. The reviewer, from a large experience of the disease, is quite aware that it is difficult to judge of the effects of remedies, as the condition may suddenly take a turn for the better under any treatment, or even under none. There are cases in which no good results from injections of galyl or allied compounds; but, on the other hand, he has seen cases in the earlier stages, in which the cornea was daily becoming more opaque under ordinary treatment and the disease was progressing, in which its progress was arrested and material improvement took place after such treatment. The provision of V.D. clinics has made it easier to get such treatment properly carried out, and, in the experience of the reviewer, some cases are unquestionably benefited.—A. E. J. L.] (*See also* RETINA.)

*Disease of the Tonsils.*—G. H. Bell[15] reports a case of double *optic neuritis* in a man of 48, whose blood-pressure was 270–170, entirely relieved by enucleation of the tonsils. J. W. White[16] reports a case of *paralysis of accommodation* following peritonsillar abscess in a girl of 9, which was relieved in a month's time. Other cases of paralysis of, and interference with, the accommodation have also been reported as the results of diseased tonsils.

P. A. Harly[17] reports three cases of *papillitis* due to chronic tonsillitis, two of whom regained normal vision, one after **Tonsillectomy** and the administration of **Sodium Salicylate**; the other after sodium salicylate and swabbing with 10 per cent **Silver Nitrate**, operation being refused. The child was still under treatment, apparently, at the time of report.

*Tuberculosis.*—W. C. Fannoff[18] makes a special point of the importance of ulcers of the palpebral conjunctiva, associated with pre-auricular or submaxillary glandular enlargements, as indicating the presence of tuberculosis, especially when occurring in children: these ulcers have a ragged edge and uneven 'worm-eaten' base, as a clinical characteristic. He gives an outline of the use of **Tuberculin** as a diagnostic and therapeutic agent, and urges that it should be properly administered and in co-operation with an internist. He emphasizes the circumstance that tuberculosis frequently occurs in the eyes of apparently healthy persons, in whom no other tuberculous focus can be found.

F. E. Burch[19] states that ocular tuberculosis occurs in patients who appear in fairly good health, no other evidence of this or other disease being present. The disease is recognized chiefly through the tuberculin reaction, the previous general history, and *x*-ray examination. Most cases of episcleritis, scleritis, sclerosing keratitis, and certain other non-ulcerative types of keratitis, ten per cent of anterior uveitis and iritis, and a few exudative choroiditis and chorioretinitis, are tuberculous in origin. While convinced of the value of tuberculin in ocular tuberculosis, he thinks that anterior segment lesions are more definitely affected by it, but suggests this may be because they can be more accurately observed than fundus lesions.

REFERENCES.—[1]*Siglo Méd.* 1921, lxviii, 453 (abst. *Ophthal. Literature*, xvii, No. 4, 505); [2]*Ann. d'Oculist.* clvii, 225 (abst. *Ophthal. Literature*, xvii, No. 4, 499); [3]*Arch. of Ophthalmol.* l, 247 (abst. *Ophthal. Literature*, xvii, No. 4, 503); [4]*Zeits. f. med. Beamte*, 1920, xxxiii, 274 (abst. *Ophthal. Literature*, xvii, No. 4, 493); [5]*Brain*, 1920, xlii, 305 (abst. *Ophthal. Literature*, xvii, No. 4, 494); [6]*Amer. Jour. Ophthalmol.* 1921, iv, 580; [8]*Münch. med. Woch.* 1921, Aug., 979; [9]*Deut. Zeits. f. Chir.* 1920, clix, 132 (abst. *Amer. Jour. Ophthalmol.* 1921, lxxvi, 1142); [10]*Rev. Cubana de Oftal.* 1921, iii, 159 (abst. *Ophthal. Literature*, xvii, No. 4, 488); [11]*Rev. Med. del Uruguay*, 1920, xxiii, 546 (abst. *Ophthal. Literature*, xvii, No. 4, 490); [13]*Deut. med. Woch.* 1920, No. 50, and *Zeits. f. Augenheilk.* 1921, xlv, 435 (abst. *Ophthal. Literature*, xvii, No. 4, 501); [15]*Dental Cosmos*, 1921, May (abst. *Ophthal. Literature*, xvii, No. 4, 507); [16]*Amer. Jour. Ophthalmol.* 1921, 276 (abst. *Ophthal. Literature*, xvii, No. 4, 507); [17]*Brit. Jour. Ophthalmol.* 1922, May, 217; [18]*Colorado Med.* xviii, 113 (abst. *Ophthal. Literature*, xvii, No. 4, 498); [19]*Minnesota Med.* 1921, iv, 198 (abst. *Ophthal. Literature*, xvii, No. 4, 479).

## EYE AFFECTIONS, GENERAL. (*See also* CATARACT; CORNEA; GLAUCOMA; REFRACTION; RETINA.)

*Lieut.-Col. A. E. J. Lister, I.M.S.*

*Diagnostic Value of Pupillary Symptoms in General Disease.*—M. L. Foster[1] relates a case of a lady who consulted him as to why her pupils were so small. She had consulted two doctors without obtaining any further information. They were found to be typical Argyll Robertson pupils, but neither doctor had examined her for tabes. She was a wealthy lady, and had consulted doctors accustomed to a high-class practice. The paper is written for general practitioners, and is worth reading. He calls attention to the fact that unequal pupils in a child are often an early sign of tuberculosis, due to swelling of the bronchial glands on the side of the larger pupil.

*Ocular Factor in Headache.*—J. A. Kearney[2] says in a general way a frontal or supra-orbital headache indicates a hypermetropic error; occipital, an imbalance of the external ocular muscles; and temporal, an astigmatic error. He rightly insists on a careful examination of the eyes in every case of headache. Many cases of brain tumour are thus diagnosed for the first time.

*Conjunctivitis.*—N. M. Black[3] has for several years met with cases in which female patients presented signs of a troublesome and intractable conjunctivitis, which he eventually traced to the use of a face powder containing rice. The suggestion appears to be that the cells from the hard exterior of the rice grains were to blame.

*Miner's Nystagmus.*—An interesting annotation on the first report of the Miner's Nystagmus Committee[4] concludes: "That as, in the body of the Report, defective illumination is considered to be the essential cause of miner's nystagmus, so, at the end of it, improvement in illumination is considered to be the preventive, not only of nystagmus itself but, by lessening the tendency to apprehension, and consequent repression, of those cases of psychoneurosis in which nystagmus is absent".

N. Stassen[5] examined 20,000 miners, of whom 8000 were seen twice in one day, just before going down into the pit and immediately on coming up after finishing work. He is convinced "that the real cause of nystagmus must be sought, not in the upward look which the miner is compelled to adopt, but solely in the faulty lighting conditions at the bottom of the mine".

*Hereditary Optic Atrophy.*—C. Morlet,[6] in an interesting paper, points out that this disease is a possible danger to the community. He traces the history of a family. Out of 22 males, of whom 12 only were adults, 11 were practically blind. Of 21 living females, only one had suffered from the disease. The majority of the males were affected about puberty. The family were extraordinarily prolific. The disease starts as a retrobulbar neuritis, without any warning; the sight becomes dim, and within two or three weeks the unfortunate individual may have to be led about. Ultimately a very large and intense central scotoma develops, which blots out the central vision from each eye. The hazy, shadowy sight derived from the periphery of the retina is little interfered with.

*Optic Neuritis.*—G. F. Siebel[7] reports a case of left-sided optic neuritis with blurring of the muscular area but no retinal hæmorrhage, ascribed to infection from septic tonsils. Vision was reduced to $\frac{20}{60}$, the field was contracted for form and colours, and the blind spot was a trifle enlarged downwards. Within thirty-six hours after enucleation of the tonsils, vision rose to $\frac{20}{40}$, and within seventy-two hours to $\frac{20}{20}$.

*Chronic Progressive External Ophthalmoplegia.*—F. Terrien[8] describes a case of this interesting disease. It is a rare condition, which usually appears in infancy. Its chief feature is the slow development of bilateral paralysis of all the extrinsic muscles of the eye, whilst the intrinsic muscles remain unaffected. Ptosis develops, and the eyeballs finally become absolutely immobile as though fixed in wax. The accommodation and pupillary reflex are not affected. The pathology is obscure, but it appears to be due to a nuclear lesion. The treatment is palliative only.

*Retinal Vascular Pressure in a case of Post-hæmorrhagic Blindness.*—Magitot[9] has studied carefully a case of post-hæmorrhagic blindness by the method of Baillart. The intra-ocular pressure was very low, 10 mm. Hg for each eye (i.e., less than half the normal). The slightest touch on the eye caused the vessels to empty themselves. After a close study and observation of the case, he concludes that if the head had been kept very low, irreparable anatomical lesions of the nerves might have been avoided.

*Visual Affections after Loss of Blood.*—These are of special interest to practitioners, as they usually are the first to see them. They occur most commonly after hæmorrhage during childbirth, in the course of phthisis, or with ulcers of the alimentary tract. Terson[10] says they have the form: (1) Of difficulty of seeing in the evening: this form rapidly recovers. (2) Of homonymous hemianopia, of cortical origin, without any change in the fundus oculi. (3) Of bilateral feebleness of the vision, sometimes monolateral, going on to partial or complete blindness, which is partially or completely curable; more usually incurable. These troubles do not appear to have occurred more than three weeks after loss of blood. They can occur at any age, though they are most frequent after 40 and in the female sex. Examination of the fundus shows an ischæmic pallor of the optic nerve, with constriction of the retinal arteries, and sometimes an œdema of the optic disc and of the retina. The conditions may clear up entirely, or result in partial or total optic atrophy. The pathology is obscure. Terson suggests there may be an absorption of tissues from the site of hæmorrhage, especially after repeated hæmorrhage. Holden has produced degeneration of the optic nerve and retina from repeated bleedings in animals.

Dupuys-Dutemps[11] considers that the ischæmia of the retina does not alone determine the trouble, but is a condition favourable to the action of a toxic or infectious agent at present totally unknown.

Pincus[12] describes 5 cases in which ocular disturbances followed loss of blood: 2 cases of amputation, 2 of prolonged epistaxis, and 1 of uterine hæmorrhage. In all cases there was atrophy, following a papillitis and contraction of the field of vision. The ocular disturbance came on two to eight days after the hæmorrhage. Goerlitz[13] also reports a case of total blindness after extreme loss of blood from duodenal ulcer.

[The reviewer once saw a young Indian woman who became totally blind after a severe internal hæmorrhage about three weeks before. The pupils were widely dilated and did not react to light, but there was nothing abnormal to be made out in the fundus. **Potassium Iodide** was ordered, and the patient returned to her home. Two months later she came back with her vision fully restored. This case very possibly had a subjective origin, but it is interesting to note that such cases may occur after a severe hæmorrhage. The patient seemed a perfectly healthy young countrywoman. As it was during the war, we were not able to work it out as fully as we would have liked.—A. E. J. L.]

TREATMENT.—*During the hæmorrhage*, keep the head low. It is suggested that the use of **Adrenalin,** in spite of its advantages, may be harmful, owing to its constricting action on the retinal vessels. Magitot[14] says it must be avoided. *When hæmorrhage has ceased*, keep the patient quiet, with head low, and apply **Very Hot Compresses** to the eyes, which should be massaged at intervals. **Dionine** may be instilled, or injected peri-ocularly, as a 1–50 solution. Iridectomy is to be avoided, but a **Paracentesis** or a **Sclerotomy** will diminish intra-ocular tension and tend to dilate the retinal vessels. **Caffeine** and **Stimulants** may be used for the general circulation, and a **Transfusion of Citrated Blood** may be given. In the later stages of atrophy of the optic nerve and retina, conjunctival and peri-ocular injections of various kinds are recommended, and **Strychnine, Phosphorus,** and **Fibrolysin** are also of value.

*Tuberculosis.*—H. Hensen[15] treated 333 cases of tuberculous eye disease with **Tuberculin by Ponndorf's Method** of cutaneous incisions (10 to 15) and rubbing tuberculin into them. Sixty-five per cent of the cases showed varying febrile reactions, and no favourable results could be observed. The duration of scrofulous keratitis was not shortened or even improved. In 3 cases fresh infiltration of the cornea followed the treatment. In one case a latent pulmonary infection was made active. He concludes that the method is inferior to tuberculin injections in which the dosage is carefully controlled, as an uncertain amount of tuberculin is introduced into the system.

*Tobacco Amblyopia.*—Pagniez[16] reports a patient with transient tobacco amaurosis. The case was peculiar in that the colour of the iris changed during the weeks of the amblyopia. For several years the young man had mild albuminuria, not above 0·5 per cent. Blood-pressure was normal. Vascular spasm in the eye would explain the amblyopia and the modification in the colour of the iris, which became much yellower. He is a great smoker, and recently had an attack of angina pectoris of the tobacco-spasm type described by Huchard. In the discussion that followed, Lanbry stated that he had seen with his own eyes the onset of the spasm of the retina responsible for the transient amaurosis in a case of lead poisoning. He has recently had a patient whose attack of intermittent claudication did not return after the young man gave up smoking. The spasms in the case are like those responsible for extrasystoles, suggesting angina pectoris from the abuse of tobacco.

*Quinine Amblyopia.*—A. W. Ormond[17] publishes six cases of quinine amblyopia. He mentions that the patient may have a visual acuity of $\frac{6}{6}$, and yet be unable to get about by himself owing to the constriction of the fields of vision. It has been suggested that quinine may have some selective action on the rods of the retina, which are more numerous in the periphery ; but Ormond suggests that the damage due to a constricted vascular supply would affect the periphery more than the centre. [This subject was dealt with fully in last year's MEDICAL ANNUAL, p. 162.—A. E. J. L.]

*Methyl Alcohol Amblyopia.*—Numerous cases of amblyopia due to ingestion of methyl alcohol are reported. Mungel[18] reports a case due to a man taking six drinks of supposed whisky. Within thirty-six hours light perception was lost. Twelve hours later a severe widespread toxic neuroretinitis was present. After eliminative, supportive, and alkaline treatment, vision in six days was $\frac{20}{20}$ and in nine weeks $\frac{20}{30}$. The author concludes : (1) Methyl alcohol produces in the optic nerve and retina the same destruction which characterizes the intake of other toxic agents. (2) It is much more dangerous, owing to the products of oxidation, formic acid being also a poison. (3) The specificity of its toxic action may be manifested as neuroretinitis or a retrobulbar neuritis. (4) The acute amblyopia is probably an interstitial inflammation of the optic nerve associated with an intense œdema, nature trying to neutralize and dilute the poison. (5) Those cases in which pressure is allowed to persist or the toxic action is specifically in the ganglion cells, are represented clinically by an absolute central scotoma ; these are hopelessly blind.

*Squint : When shall we operate ?*—A. S. and L. D. Green[19] arrive at the following conclusions : (1) Age is the greatest single factor in the non-operative cure of a squint. Treatment must be instituted before the age of eight, preferably when the squint first becomes manifest, even in infancy if necessary. (2) It is of vital necessity that the family physician and the public be impressed with the necessity that the child have early attention, and not wait till puberty in the hope that the deformity will be outgrown. Procrastination means probable amblyopia in the deviating eye, and operation later, in the vast majority of cases, for cosmetic reasons. (3) Operations should be performed in all cases in which there is no reduction in the squint under complete cycloplegia, irrespective of the age of the patient. [Most practitioners are now fully alive to the necessity for immediate attention to squint, but there is still a tendency on the part of the parents to " see if he will grow out of it ", due often to the natural dislike of glasses for a child, or fear of operation. The practitioner can render an invaluable service to the patient by explaining the danger of delay in having the eyes examined. Many authorities would not operate so early as the authors advocate, but all believe in early treatment.—A. E. J. L.]

*Phlegmon of the Conjunctiva following an Operation for Pterygium. Loss of the Eye.*—The illustrations (*Plates XXI, XXII*) show the course of a phlegmon of the conjunctiva following an operation for pterygium.[20] The operation was done in a special hospital with every precaution. Corneal ulcer and iridocyclitis finally developed, and the eye was enucleated. No organism was recovered from the eye ; and pus from it, injected intraperitoneally into a guinea-pig, produced no results.

E. Jackson,[21] in an editorial on the " Risks of Operation ", comments on the case, and says that if both eyes had been operated on simultaneously, both might have been lost. He says the reason for doing bilateral operations is nearly always convenience, and that no surgeon has the right to take the smallest chance of blinding a patient. A thousand operations without harm do not compensate one patient for blindness. He says that a generation ago there were patients going about whose convergent squint had been converted into wide divergence without even a trial of glasses. There are now patients without such noticeable cosmetic defects, whose headache and neuralgia have been made more burdensome by elaborate and carefully planned advancements, that seemed greatly to reduce the heterophoria, but produced unfamiliar co-ordinations with which the weak nervous system was unable to deal.

[Bilateral operations are performed by many operators in India at the patient's request, as they come a long way, and many cannot afford to come again. The writer has done many such, but latterly gave it up entirely, as he felt it was unsound. He would not have hesitated, however, to do such a simple operation on both eyes as for a pterygium, and has often done it. Others reading this article will have done it often, but in the light of this experience, exceptional though it may be, it behoves them to reconsider the matter, as the loss of both eyes from a pterygium operation is too terrible to contemplate.—A. E. J. L.]

# PLATE XXI.

## PHLEGMON OF CONJUNCTIVA FOLLOWING OPERATION FOR PTERYGIUM

(KIEHLE)

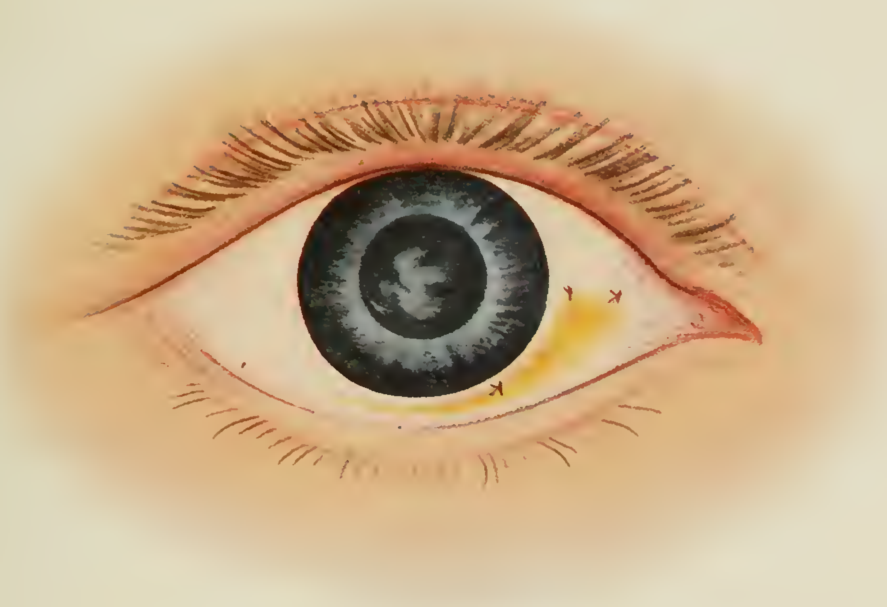


*Fig. A.*—Conjunctival phlegmon one day after operation.

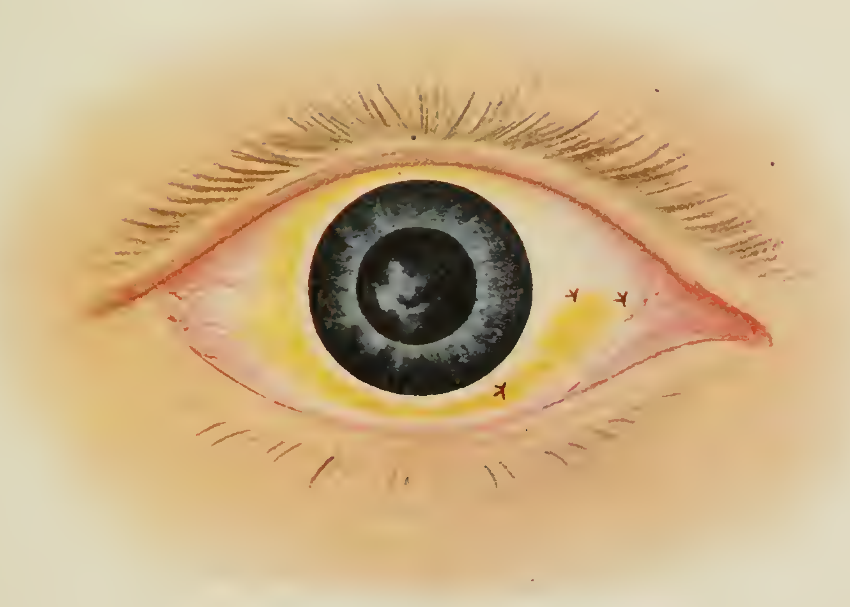


*Fig. B.*—Appearance of eye two days after operation.

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# PLATE XXII.

## PHLEGMON OF CONJUNCTIVA FOLLOWING OPERATION FOR PTERYGIUM—*continued*

(KIEHLE)

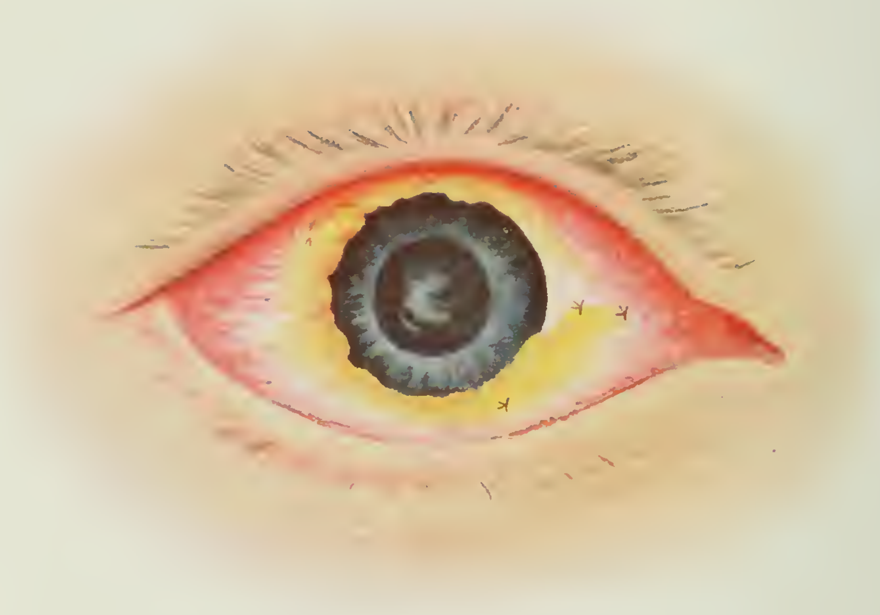

*Fig. C.*—Condition seen after four days.

*By kind permission of the 'American Journal of Ophthalmology*

*Prevention of Post-operative Intra-ocular Infections.*—G. H. Bell,[22] in an interesting article, gives an account of 400 intra-ocular operations without an infection. He considers the arch enemy of the ophthalmic surgeon to be oral sepsis. Patients must stand the acid test for the three 'T's' (teeth, tonsils, toxæmia). Twenty-four hours before operation a dose of castor oil is given. If an eye looks clinically clean, he ignores bacteriological findings. He ignores senile catarrhs. Two hours before operation, 2 drops of a 1 per cent solution of **Silver Nitrate** are dropped into each eye. This produces an intense irritation. The eye is washed out with normal salt solution before operation. After operation, 2 drops of a 3 per cent solution of **Atropine** and 25 per cent solution of **Argyrol** are instilled, and both eyes are bandaged for forty-eight hours. Then the eye is dressed and argyrol and atropine are instilled. This is repeated after intervals of two days. Bell believes that the stimulation of the silver nitrate produces leucocytosis, and protective organisms are formed, which take care of the micro-organisms if any are present. Burchell's experiments in the bacteriological laboratory tended to confirm this opinion. In the discussion, Verhoeff mentioned that he now used 4 per cent argyrol, which was about equal in bactericidal power to 1 per cent silver nitrate, and had not had a single infection since using it. [This paper is worth reading. Any information which helps to reduce sepsis is of great importance, especially to practitioners resident abroad, many of whom perform large numbers of intra-ocular operations. The reviewer agrees with Verhoeff, who in the discussion pointed out the difficulty of drawing definite conclusions about sepsis, as it occurs so seldom. He has used a douche for many years of 1–3000 **Perchloride of Mercury** before intra-ocular operations, except for trephining. He believes with Bell that the stimulating action on the defensive mechanism is an important one. Whilst fully believing in taking every precaution against oral sepsis where possible, his experience is that many such cases can be operated on with impunity. In India it is usually quite impossible in hospital practice to do anything to the mouth beyond giving an antiseptic mouth-wash, which in many cases is not used properly, if at all. To do so would be to drive the patient to the bazaar quacks, who couch the lens without bothering the patient about anything. Yet the writer has had a series of 250 cataract cases without septic infection occurring. Most of the patients were old and enfeebled and the majority had oral sepsis, many of their mouths being filthy. He is of opinion that an important point in preventing sepsis is that no instrument should ever be introduced a second time into the eye without being re-sterilized. This is not difficult to carry out, if a little attention be given to the matter.—A. E. J. L.]

*Foreign Bodies in the Anterior Chamber.*—Meyling[23] reports a wound of the eye by a steel writing pen: immediate retraction of the point of the pen brought with it an eyelash clasped by the points. Months later, when the blood from the anterior chamber had been absorbed, two lashes were seen upon the anterior capsule of the lens, embedded in fibrin. The lashes are still visible, and show loss of their pigmentation and fibrillary decomposition; there was not the slightest irritation.

*Penetrating Wound of the Eye.*—The practitioner consulted in a case of this kind may have to decide whether there is a foreign body in the eye, as the fate of the eye may depend on this first examination. The main thing is to prevent infection. Alcohol, ether, or iodine should not be used around the eyes. R. Argañaraz[24] advises instilling 2 or 3 drops of a 1 per cent solution of **Cocaine,** and then copiously flushing the conjunctival sacs with **Saline.** If the wound is in the cornea, he advises introducing a little of a 1–1000 **Mercuric Chloride Salve,** applying a cotton bandage, and referring the patient to the nearest eye clinic; but if there is hernia of the iris, this should be reduced first. If it cannot be reduced, he advises to snip off the herniated portion level with the cornea, with fine scissors. This simple intervention allows the corneal wound to heal naturally. He expatiates in conclusion on the great benefit from parenteral **Injection of Milk** in every grave suppurative process in the eye. His practice is a daily intragluteal injection of 5 c.c. of fresh milk, heated to 90° C. for three minutes only. (*See also* p. 182.)

*The Repair of Scleral Wounds (including Rupture) near the Limbus.*—Practitioners abroad and elsewhere may have exceptionally to deal with a scleral wound or ruptured sclera. *Figs. A, B, C (Plates XXIII, XXIV)*, from an article by L. M. Francis,[25] show a useful method of employing a double conjunctival flap to cover the wound. The details of the technique are not given from want of space, but the general idea will be readily grasped from the illustrations. One or two points should be noted. The length of the flaps should be tested by stretching them across the cornea. If there is any normal conjunctiva between the wound and the limbus, the surface is slightly denuded and roughened by means of a curette in order to allow of union with the flap that will cover it later. *Fig. D (Plate XXIV)* shows a method of dealing with small perforating wounds only. In rupture of the sclera, the provision of a flap from the opposite side is necessary.

*Lachrymal Sac.*—R. E. Wright[26] describes the method of **Extirpation** used in Madras. He lays stress on occluding the canaliculi. He does this by clamping them with mosquito forceps before dividing them. He emphasizes locating and avoiding the angular vein during the operation. [The reviewer agrees with Wright that avoidance of the angular vein is the chief factor in the smooth performance of the operation.—A. E. J. L.]

Many papers have appeared recently on the treatment of *dacryocystitis* and *lachrymal obstruction* by the operation of **Dacryorhinostomy**.[27] Two different methods have been advocated chiefly: the open method, where the sac is incised through the skin and an opening made from it into the nose; and the closed method, working through the puncta into the sac and thence into the nose, or in the contrary direction, from the nose into the sac. Many of the papers are comments and minor variations of the original Toti operation. It would appear that the closed method has the most champions. [Whilst the older operation of removal of the lachrymal sac has the disadvantage of epiphora, especially when the eye is exposed to cold wind, etc., it would appear that it is still the operation most extensively performed in England, probably on account of its simplicity and the exclusion of the danger of possible infection of the eye from the nasal cavity.—A. E. J. L.]

*Spectacles: an Insurance against Traumatism.*—Practitioners as well as oculists are frequently asked by anxious parents if it is not a risky thing for a child to wear glasses on account of the ease with which glass breaks. This is a perfectly natural question. It is interesting to note that H. Gifford,[28] during thirty-three years of eye work, has met with five cases in which an eye has been injured by a broken spectacle glass. *In none of these was the eye lost*, and in at least two of them it is probable that had glasses not been worn a worse injury would have occurred. On the other hand, Gifford states that he has seen some 2300 cases of serious traumatic injury to the eye, at least 90 per cent of which would probably not have occurred if glasses had been habitually worn. He concludes: "The protection which spectacles afford is so much greater than the risk which they involve, that every person with only one eye should habitually wear them".

[It is of great interest to have such a record. The experience of the reviewer agrees with that of the writer. To the uninitiated it would appear probable

# PLATE XXIII.

## REPAIR OF SCLERAL WOUNDS

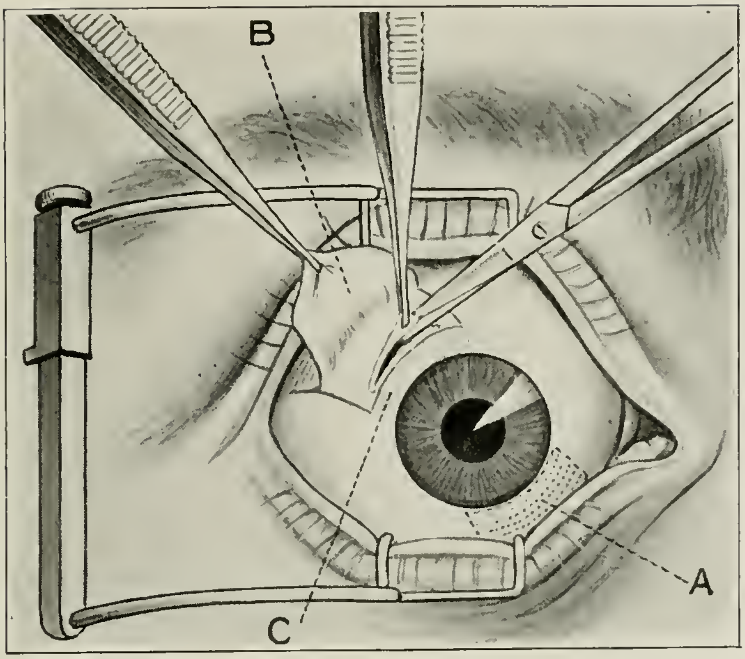

*Fig. A.*—Repair of scleral wound. A, site of flap opposite wound; B, equatorial flap, elevated; and C, area of conjunctiva roughened. Toilet of scleral wound.

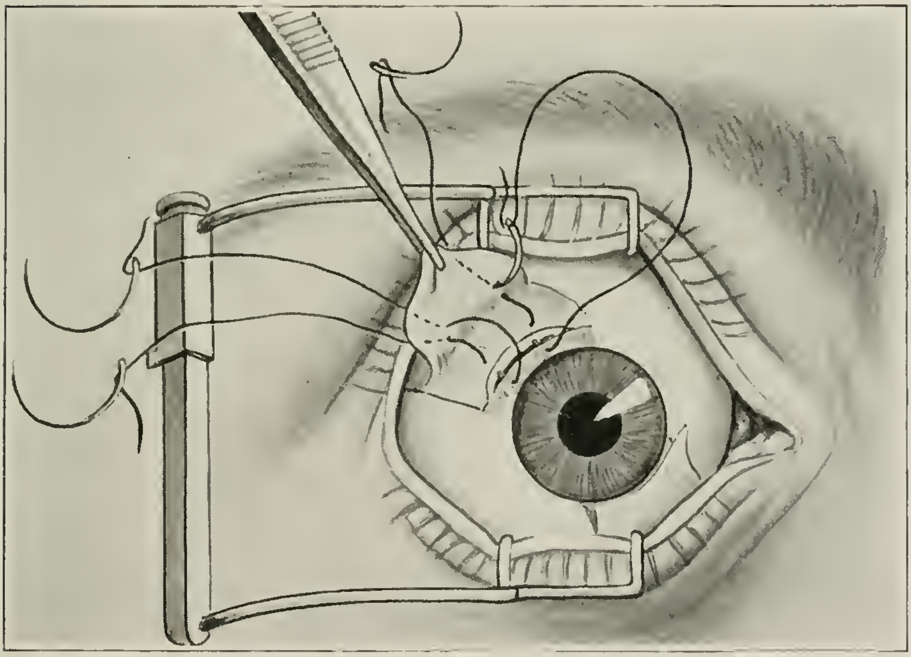

*Fig. B.*—Scleral sutures mattressed through equatorial flap.

*Redrawn by permission from the*
*'Journal of the American Medical Association'*

## REPAIR OF SCLERAL WOUNDS—*continued*

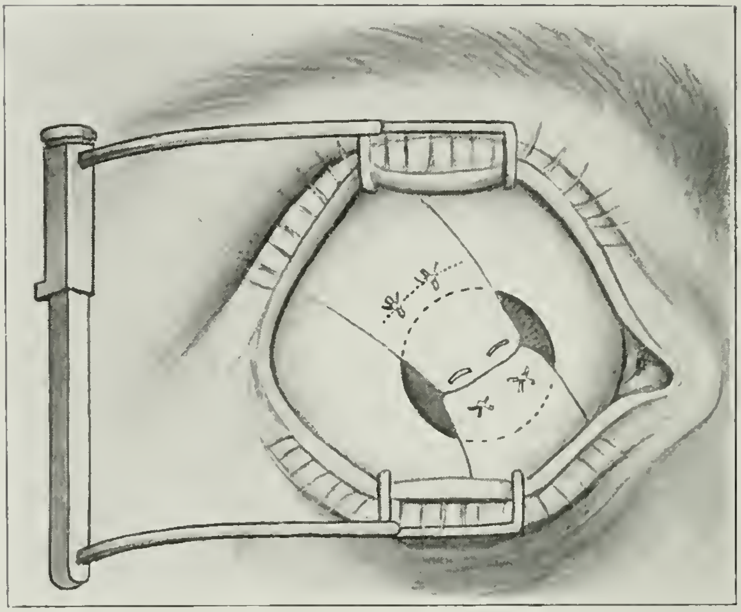

*Fig. C.*—Flaps in position; sutures tied.

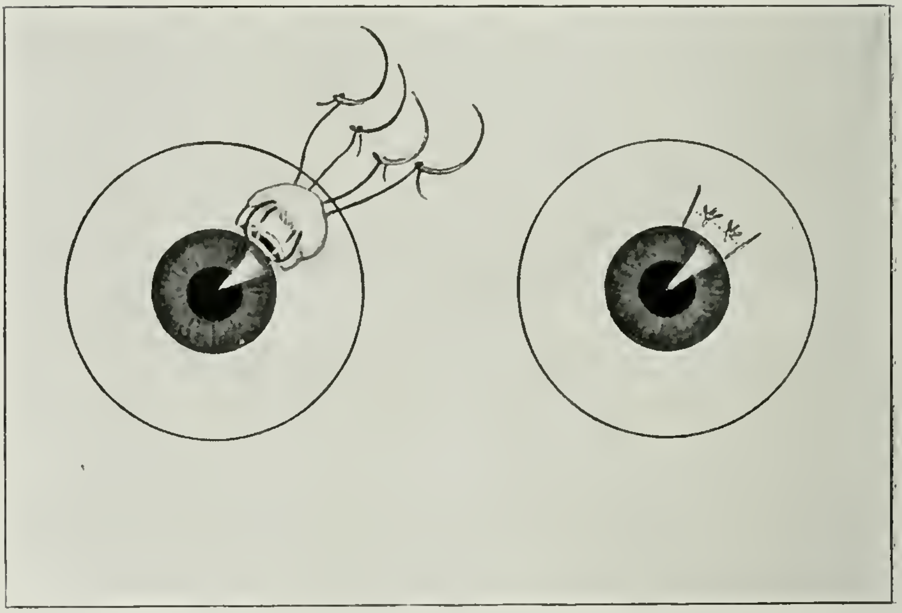

*Fig. D.*—Single equatorial flap for small wounds.

that a polo ball, hit with tremendous force straight at the eye, would almost certainly drive into the eye some fragments of the glass of the spectacle worn. Yet the reviewer has seen a case in which such a blow was received, and though the patient was stunned, the eyebrow split open, the tissues around badly bruised, and the lens subluxated, no damage was done by the fragments of the lens, notwithstanding that it was shivered to atoms and the spectacle frames were badly bent by the force of the blow.—A. E. J. L.]

*Injury from Glass in a Chemical Explosion.*—Werner[29] reports the case of a boy, age 13, who was preparing oxygen by heating chlorate of potassium and manganese dioxide, when the flask exploded and injured his eye. Finally the right eye had to be excised, and a piece of glass 6 mm. long was found in it. The left eye developed a traumatic cataract. [It is very sad to think that this boy's sight would probably have escaped injury had he been wearing goggles. One can recall several hairbreadth escapes whilst doing practical chemistry ; yet no one ever suggested the use of protective goggles, though one of my teachers had had his own eye seriously damaged by an explosion in the laboratory. As the sons of medical men often go into some scientific profession, and they are also often in touch with scientific teachers, I have thought it worth while recording this case to call attention to a possible danger and to point out a simple remedy.—A. E. J. L.]

*Eyeglasses versus Spectacles.*—Every doctor has been asked, " Shall I wear eyeglasses or spectacles ? " If the patient is a young girl, it is pretty certain that as a rule she would prefer eyeglasses, if for constant use. F. G. Murphy[30] says that the condemnation of eyeglasses has been too sweeping by some authorities. Though there are many who, because of their vocation or shape of nose, should not wear them, there are thousands who can and do wear them with greater comfort than spectacles. He says it is more usual to see spectacles with one glass cocked higher than the other, than eyeglasses improperly worn. He gives reasons why eyeglasses stay in place better than spectacles. He points out the advantage to ladies who have to take off their glasses in the winter months in America, on entering a warm room, in order to remove the steam, as eyeglasses do not disturb their hair. He says that the modern eyeglasses with their stiff guards have altered the question altogether. [Anyone who has seen a lady remove a pair of rimless spectacles in the way the writer has frequently seen them removed, must admit there is a good deal to be said for eyeglasses in suitable cases. In many instances they are more bent out of shape and fit worse than eyeglasses would probably have done, with more wear.—A. E. J. L.]

*Prevention of Steaming of Glasses.*—A. S. Percival[31] calls attention to the fact that the steaming of glasses could be entirely prevented by rubbing the spectacles with dry soap, then wiping it off and polishing the glasses. It would be found that breathing on the glasses failed to dim them. Laundry-women could do their work in hot, steaming wash-houses without any trouble from their glasses getting dimmed if they adopted this simple precaution. [This is not a new discovery, but we think it well to call attention to it, as it is of great practical use. Dental and other mirrors which have to be exposed to moisture can be similarly treated, with very little loss of reflecting power.—A. E. J. L.]

*Blepharitis.*—Z. Malta,[32] in the course of his work, has found the specific cause of blepharitis, the Morax bacillus, in the throat and nose of such cases. A proof of the intimate connection is the improvement of the condition of the lids on applying active treatment of the nose and throat, together with local treatment of the lids. For tonsillectomy, the prolonged painting with tincture of iodine can be substituted. The nose can be douched with lotions, and then smeared, as far as it can be reached, with zinc sulphate or yellow ointment.

References.—[1]*N.Y. Med. Jour.* 1921, Nov., 563; [2]*Ibid.* 565; [3]*Ann. of Ophthalmol.* 1915, July (abst. *Brit. Jour. Ophthalmol.* v, No. 10, 471); [4]*Brit. Jour. Ophthalmol.* 1922, June, 266; [5]*Jour. of Industrial Hygiene*, 1921, ii, 451 (abst. *Ophthal. Literature*, xvii, No. 4, 524); [6]*Med. Jour. of Australia*, 1921, Dec., 499; [7]*Ophthal. Record.* 1917, June (abst. *Brit. Jour. Ophthalmol.* v, No. 10, 471); [8]*Presse méd.* 1921, Nov., 937; [9]*Ann. d'Oculist.* clvi, 1919, Nov. (abst. *Brit. Jour. Ophthalmol.* 1922, May, 229); [10]Soc. d'Ophtal. de France, *Presse méd.* 1921, Dec., 975; [11]*Ibid.*; [12]*Arch. f. Ophthalmol.* xcviii, 3 (abst. *Ophthal. Literature*, xvii, No. 4, 506); [13]*Klin. Monats. f. Augenheilk.* lxiv, 1920, 762; [14]Soc. d'Ophtal. de France, *Presse méd*, 1921, Dec., 975; [15]*Zeits. f. Augenheilk.* xlii, 1919, 116 (abst. *Ophthal. Literature*, xvii, No. 4, 500); [16]*Bull. Soc. méd. des Hôp.* xliv, 956 (abst. *Ophthal. Literature*, xvii, No. 3, 276); [17]*Guy's Hosp. Rep.* 1921; [18]*Amer. Jour. Ophthalmol* 1920, 756 (abst. *Ophthal. Literature*, xvii, No. 3, 277); [19]*Jour. Amer. Med. Assoc.* 1921, Sept., 1003; [20]*Amer. Jour. Ophthalmol.* 1921, Dec., 881; [21]*Ibid.* 1922, Jan., 62; [22]*Jour. Amer. Med. Assoc.* 1921, Oct., 1096; [23]*Amer. Jour. Ophthalmol.* 1921, 607 (abst. *Ophthal. Literature*, xvii, No. 4, 466); [24]*Semana Méd.* (abst. *Jour. Amer. Med. Assoc.* 1922, April, 1091); [25]*Jour. Amer. Med. Assoc.* 1921, Oct. 1, 1099; [26]*Ind. Med. Gaz.* 1922, Feb., 53; [27]M. H. Post, jun., *Ophthal. Literature*, xvii, No. 3, 370; [28]*Ophthal. Record*, 1919, Oct. (abst. *Brit. Jour. Ophthalmol.* v, 1921, No. 10, 471); [29]*Trans. Ophthalmol. Soc. U.K.* 1920, 443 (abst. *Ophthal. Literature*, xvii, No. 4, 468; [30]*Amer. Jour. Ophthalmol.* 1921; [31]*Brit. Med. Jour.* 1921, ii, 732; [32]*Ophthal. Soc. of Egypt Bull.* 1921 (abst. *Brit. Jour. Ophthalmol.* 1922, May, 223).

## EYE, GENERAL THERAPEUTICS OF.

*Lieut.-Col. A. E. J. Lister, I.M.S.*

*Over-treatment.*—E. Jackson[1] has an excellent editorial article on 'over-treatment', which appeals very strongly to the reviewer. He says that the tendency of the conscientious physician is to do too much for the patient; failure to apply standard therapeutic resources effectively is so severely criticized by the laity that there is apt to arise a feeling that it is better to do too much for the patient than too little.

An important form of over-treatment is the too frequent repetition of local applications. Every application to the conjunctiva that provokes a sharp reaction will cause a lasting harm if repeated before the reaction has run its course to approximate restoration of the normal nutritive balances. Even mild remedies such as yellow oxide may be too frequently applied. In some cases it provokes a sharp reaction, and, in such a case, repetition of the application every night may evidently aggravate the patient's trouble. Yet repeating it once or twice a week may bring rapid improvement. An infant with ophthalmia neonatorum may have its sleep broken and be decidedly the worse therefore, through cleansing its eye at too short intervals before the secretion has re-accumulated so as to require removal. In general there is an optimum of frequency in treatments that will secure the best results. It must be recognized that certain conditions, such as neuropathic inflammations, the corneal complications of herpes zoster, and those of small-pox, will get well but slowly, and will only be made worse by attempts to hurry them.

Attention is called to the well-known fact that **Atropine** sets up a condition that keeps the lid sore and sensitive to light, although the inflammation for which the drug was used has subsided. Very few patients show an idiosyncrasy to atropine that prevents its use even for a short time; but a much larger number are liable to develop an atropine conjunctivitis through its prolonged use, thus giving the impression that the inflammation of the cornea or iris for which it was prescribed is not yielding properly to treatment. Such a conjunctivitis is likely to present enlarged follicles that may resemble those of trachoma, and to be accompanied by photophobia.

**Dionin** has come into very general use, and Jackson's remarks about it are well worth bearing in mind. After pointing out the fact that too frequent application of the drug causes it to lose its beneficial influence, he says there is reason to believe that the repetition of its effects, even at intervals of one or more days over a long period, may be harmful. It may even increase the corneal opacities and thickening of the conjunctiva which the drug was expected to remove, particularly if the interval between the applications is too short. A well-needed caution is given in reference to the staining produced by the prolonged use of **Silver Preparations.**

Jackson concludes a useful article by saying that familiarity with the employment of drugs only makes it more necessary to remember possible damage that may be done with them, and to keep well in mind the questions, "Has the drug been used long enough ?" "Would it be better to lengthen the interval between applications or doses ?"

[The writer has seen too often the effects of over-treatment in India. Patients there are apt to be very insistent on energetic treatment. He has frequently seen the conjunctiva absolutely black from the prolonged use of silver salts. He has often seen patients who have been using protargol from time to time, in whom staining of the conjunctiva was beginning, who had no idea of this possibility. He strongly recommends that every patient should be warned against using silver salts on their own responsibility for prolonged periods, especially in the East, where eye affections are often difficult to cure quickly. He thinks some trachoma patients in India have their conjunctiva permanently damaged by the prolonged use of too strong remedies. If a slight chronic conjunctivitis is not clearing up under treatment with local applications, it is sometimes a useful plan to discontinue them for a week or so, giving only a normal saline lotion. He has not infrequently seen them clear up or be benefited by this.—A. E. J. L.]

*Blunders in Treatment of the Eyes.*—Zeeman,[2] among others cases, describes one in which a nævus of the iris was mistaken for a foreign body, the actual foreign body having escaped in the interim. A family physician was called to an infant on account of a stye ; he reassured the parents, but the lesion worked backwards into the depths, with fatal results. A timely incision might have averted this. He cites a number of cases in which a foreign body had been long overlooked, while the eye was being treated on a mistaken diagnosis.

[No one is infallible, and the practitioner is often additionally handicapped by not having the requisite appliances. It is a fact, however, that foreign bodies in the cornea are often overlooked. If practitioners would make a point, when in doubt, of examining the cornea carefully with a loupe in a dark room, before saying there is nothing in the eye, they would escape the humiliation which the subsequent discovery of the foreign body entails. The patient does not realize that it is often difficult for one not in constant practice to see it, and it requires a good deal to convince him that the doctor has not been careless. Cases in which a foreign body has been three or four days in the cornea, with the patient using an eye-wash, having been told he has a 'cold in the eye', are not uncommon. It is well, therefore, to have a paper like this as a reminder.—A. E. J. L.]

*Trachoma.*—P. Ganguli[3] writes most enthusiastically as to the value of **Acriflavine** in trachoma. He claims to have cured 38 out of 40 cases in an average period of sixty-seven days. Uncomplicated cases never developed any complications under the treatment. Complications, if any, did not progress in the majority of cases. His technique is as follows : The eyes are thoroughly washed with potassium permanganate lotion ($\frac{1}{2}$ gr. to one pint). The upper and lower lids are rubbed against each other for a minute. The eyes are irrigated again with the same solution, and the massage is repeated. A solution of acriflavine 1–500 is then dropped into the eye, and the patient is kept in bed with the eyes closed for fifteen minutes. [A careful study of the article leads the reviewer, who has had a very large experience of trachoma, to the conclusion that though acriflavine may be of value in trachoma, it is not the panacea the writer would have us believe. The simplicity of the treatment, and the apparent absence of pain, are important points, and it is to be hoped that others will report their experience with the drug.—A. E. J. L.]

*A New Local Anæsthetic.*—A Committee of the American Medical Association,[4] who have investigated the properties of **Butyn**, report: "The results of the clinical and experimental use of butyn seem to justify the committee in arriving at the following conclusions: (1) It is more powerful than cocaine, a smaller quantity being required. (2) It acts more rapidly than cocaine. (3) Its action is more prolonged than cocaine. (4) According to our experience to date, butyn in the quantity required is less toxic than cocaine. (5) It produces no drying effect on the tissues. (6) It produces no change in the size of the pupil. (7) It has no ischæmic effect, and therefore causes no shrinkage of tissues. (8) It can be boiled without impairing its anæsthetic efficiency. E. Jackson,[5] commenting on the report, says it is too soon, probably, to claim that butyn is non-habit-forming, and the careful practitioner will not presume on the apparent advantage of its being less toxic. But the results of the careful investigation that has been going on for about a year, and the competent, conservative character of the members of the Committee that reports upon it, fully justify its extended trial by all progressive ophthalmogists. [E. Jackson is the distinguished editor of the *American Journal of Ophthalmology*, and his endorsement of the Committee's report, with its wise reservations, justifies even the conservative practitioner in trying the drug for himself.—A. E. J. L.]

*Best Method of using Cocaine to produce Intra-ocular Effect.*—L. Post,[6] after a series of careful experiments on rabbits, concludes that the best method of using cocaine to produce ocular anæsthetic action in the iris is that of repeated instillations. Subconjunctival injections have no special advantages. Absorption of cocaine is greatest from half an hour to an hour after beginning fifteen minutes of repeated instillations or subconjunctival injections. [These experiments will interest all who have much experience of using cocaine for eye operations. Faulty cocainization usually results from not allowing sufficient time for the drug to act. If the lids are kept closed by a moist swab, damage to the cornea will be averted and no harm will result from waiting; when the iris is cut, pain will be avoided. This may make the difference between a good and a bad result in a cataract operation in a nervous and sensitive patient.—A. E. J. L.]

*Drugs in Ophthalmology.*—W. H. Wilmer,[7] in an interesting paper on the value of drugs in ophthalmology, calls special attention to the value of **Syrup of Ferrous Iodide** in many ocular conditions, especially in those occurring in badly-nourished patients. He quotes Reber as saying: "In interstitial keratitis of children it is almost a panacea".

**Bromides.**—He points out that the use of bromides, in addition to the application of local anæsthetics, will prevent the danger of 'squeezing', and will help to keep patients quiet after the operation.

**Veronal.**—He quotes one patient as saying, "It sent me nearly crazy". He points out that it sometimes produces great excitement, and its use is therefore not without danger in ophthalmic surgery.

**Calomel.**—Even people who are much annoyed by 'muscæ volitantes' affirm that the specks are much less troublesome after a good clearing out with calomel.

**Holocaine.**—Used chiefly on account of its antiseptic properties, absence of effect on the pupils and corneal epithelium, and lesser toxicity. Most useful for removing foreign bodies, on account of these properties. Its sterilizing and stimulating effect in corneal ulcers makes it very valuable.

**Atropine.**—Mydriasis and partial paralysis of accommodation have followed the use of a belladonna plaster on the back. He gives the caution that in elderly people the continued use of cathartics containing belladonna may play a contributory part in the causation of chronic glaucoma.

**Iodine.**—Very efficacious in the treatment of corneal ulcers. A 2 per cent solution applied to the lid margins has no superior in nearly all cases of blepharitis. The crusts must, of course, be removed first.

**Silver Nitrate.**—In several cases a 2 per cent solution dropped in the delicate cornea of a new-born child as a preventive has caused great reaction and whitening of the corneal epithelium.

**Argyrol.**—Wilmer considers it of the greatest value in all chronic and acute purulent affections of the eye. Later laboratory tests have corroborated the clinical findings of its effectiveness as a bactericide, though the first reports were unfavourable to it.

**Physostygmine.**—The solution used should not be stronger than is necessary to produce the desired effect. An interesting and instructive case is detailed of a woman who had been using $\frac{1}{10}$ gr. to one ounce of **Eserine Salicylate** twice a day in each eye, with good effects on the intra-ocular tension. Having broken the bottle, she was given a 1-per-cent solution by a physician. Within two hours after its instillation an acute attack of glaucoma supervened, which later required an operation.

*Subconjunctival Injections.*—Wilmer feels that **Mercurial Salts** have at times been used unwisely and unnecessarily. He calls attention to Darier's dictum, namely, that: "When there is present circulatory stasis, rendering absorption of medicaments difficult or impossible by the obstructed lymphatics, subconjunctival injections are contra-indicated. Under such circumstances, mercuric cyanide injected beneath the conjunctiva will act as an irritant more harmful than useful, and produce great pain and chemosis". Patients complain bitterly of the pain after its use in uveal inflammation, detached retina, etc. Wilmer concludes that there has been a tendency to overlook the great factor of bodily and tissue resistance, and to consider the one great factor in infection to be in the invading bacilli and their toxins. The serious study of food products of late is a step in the right direction.

[Having had considerable personal experience of general practice, the reviewer knows that practitioners are always glad to have further information about the drugs they actually use, and to be reassured as to their value in certain cases. He has used bromides before eye operations for many years with good results. The warning about **Veronal** is useful. The unexpected is apt to happen at most inconvenient times. He considers that **Holocaine** might be used with advantage more extensively than it appears to be in England. He has employed it a great deal during the last ten years. Apart from the indications mentioned, he has used it with advantage after the application of silver nitrate and copper sulphate to the lids, to prevent pain. The best way to apply it is to paint it on to the lids, after the application of the medicament, allowing, of course, a sufficient interval. It is most effective. Having had personal experience on three occasions of the unpleasant effects caused by the instillation of cocaine, he can well appreciate one of the advantages of holocaine. The discomfort of a widely-dilated pupil on a sunny day has to be experienced to be fully appreciated. Practitioners who are forced to give something to relieve pain in the eye after abrasions, etc., should note that holocaine is antiseptic and stimulating, and does not affect the corneal epithelium. We have often seen the bad results of the continual use of cocaine in corneal ulcers. The epithelium in the region of the ulcer is further damaged, and, as micro-organisms more readily attack tissues of lowered vitality, there is sometimes a serious extension of the ulcer. Yet it is sometimes necessary, where there is great photophobia, to put in a local anæsthetic to examine an eye for a corneal lesion. Holocaine therefore is well worthy of a place in the dispensary. It is well to note that a strong solution of eserine may produce an acute attack in a case of chronic glaucoma.—A. E. J. L.]

*Local Anæsthesia.*—A Committee of the American Medical Association,[8] after most careful investigation, has issued a valuable report on this subject, from which we cull the following: For surface anæsthesia, **Cocaine** in 4 per cent solution is superior to all its rivals. The penetrating effect of cocaine solution is increased by the addition of 0·5 per cent solution of **Sodium Carbonate.** The efficiency of cocaine solution is not impaired by boiling, nor is it affected either as to intensity or prolongation of anæsthesia by the addition of epinephrin. Solutions of cocaine stronger than 4 per cent may damage the cornea and interfere with healing. A warning is given that alkalis should not be added to **Holocaine** solutions, as they cause precipitation. The use of glass bottles should be avoided; in preparing the solution, porcelain should be used, as holocaine is incompatible with alkalis and their carbonate bases.

[Most surgeons of experience will agree with these findings. The point about the preparation of holocaine solution is worth noting, as the reviewer had trouble in making a clear solution till he learnt it from experience.—A. E. J. L.]

*The Miracle of Milk in Ocular Therapy.*—E. Thomson,[9] reviewing an article by J. Fradkine, asks, "Have we paid sufficient attention to the use of sterilized milk in infective ocular conditions in this country?" Fradkine, admittedly a doubter when he commenced the treatment in 1918, appears to have been quite converted to it. He is of the opinion that the milk miracle is explained solely by the fact that one introduces into the scheme of the organism a rich quantity of alexines which shall destroy the microbes, already sensitized by their special fixation agent. Hence the remarkable indifference to the *kind* of microbe exhibited by all writers. It is not, in fact, a question of specific medicament for a given race of microbes, but of an aspecific substance, alexine, which is wonderfully active on any kind of bacterial element. Possibly the special advantages of milk lie precisely in its great richness in alexines.

F. C. Zimmermann[10] has had gratifying results from parenteral injections of milk in *phlyctenular kerato-conjunctivitis* in cases with a strumous diathesis. He sterilized the milk for ten minutes previous to injection into the gluteal region. (*See also* pp. 169 and 176.)

*Protein Therapy in Ophthalmology.*—De Haan[11] comments on the favourable reports that are constantly being published on the effect of parenteral injection of milk in various eye affections. He says, however, that we must try to find some substance that will give the same good results without the disagreeable by-effects sometimes noted with milk. These are a very rapid softening up of a corneal abscess and its perforation; also an abscess forming at the point of injection. Some other point than a gluteal muscle might be preferable for the injection. With tuberculosis, scrofula, and typhoid there is liable to be a focal reaction; it may accelerate a cure or may entail a cavity. With typhoid, an apical catarrhal process has been speeded up, and scrofulous children have been known to have fever for weeks after the parenteral injection. Heart and respiratory disturbances have also been noted, and anaphylactic shock. With the status lymphaticus and asthenia the injections are liable to cause more disturbance than under other conditions. From 5 to 10 c.c. of milk is the dose employed for adults. The febrile reaction begins in four hours, and reaches its height by the eighth or tenth. The higher the reaction, the greater the beneficial effect as a general rule.

[*See also* Medical Annual, 1922, p. 164. Further experience shows that this remedy must be used with care.—A. E. J. L.]

References.—[1]*Amer. Jour. Ophthalmol.*; [2]*Jour. Amer. Med. Assoc.* 1921, Aug., 582; [3]*Ind. Med. Gaz.* 1921, July, 251; [4]*Amer. Jour. Ophthalmol.* 1922, Jan., 58; [5]*Ibid.* Feb., 149; [6]*Jour. Amer. Med. Assoc.* 1921, Oct., 1323; [7]*Ibid.*, 1223; [8]*Ibid.* Nov., 1730; [9]*Clinique ophtalmol.* 1921, Aug. (abst. *Brit. Jour. Ophthalmol.* 1922, March, 135); [10]*Amer. Jour. Ophthalmol.* 1921, Jan. (abst. *Brit. Jour. Ophthalmol.* 1921, Sept., 430); [11]*Nederl. Tijds. v. Geneesk.* 1921, Sept., 1421 (abst. *Jour. Amer. Med. Assoc.* 1921, Dec., 1934).

### EXOPHTHALMIC GOITRE. (*See* Thyroid Surgery.)

### FACE, PLASTIC SURGERY OF. (*See* Plastic Surgery.)

### FÆCAL INCONTINENCE (Incontinence of the Rectum).

*J. P. Lockhart-Mummery, F.R.C.S.*

This is a serious condition and causes most acute distress to sensitive persons. It may result from any of the following causes: (1) Diseases of the central nervous system, paralysis, myelitis, loss of sensation in the anal region, epilepsy. (2) Temporary incontinence often occurs in acute illness, such as pneumonia, typhoid, etc. (3) In the aged, from loss of power in the sphincter muscle. (4) From prolapse of the rectum owing to stretching of the sphincter. (5) The presence of a foreign body, or large stercolith, in the rectum, is a common, but frequently unrecognized cause. (6) Operations on the rectum, such as for fistula, piles, etc: this condition should never arise if the operation is properly performed. (7) Traumatism, due to accidents, and in women from splitting of the perineum in childbirth.

Charles Drueck,[1] in a paper on "Dangers of Operations for Rectal Fistula", discusses the various operative mistakes which may be the cause of incontinence of the sphincter. Permanent incontinence should never follow a properly performed operation for fistula, but it is very liable to do so if the muscle is carelessly divided. Cutting the muscle across laterally is always dangerous, and it is better, when this is necessary, to perform the operation in two stages, laying the fistula as widely open as possible at the first operation, but without dividing the sphincter, and dividing the muscle a fortnight later. Severe sepsis following any operation upon the rectum may be a cause of incontinence, and should not, of course, occur. On no account should the sphincter ever be cut on opening an ischiorectal abscess. Incontinence occasionally results from dividing the sphincter for fissure; but in spite of what is said in most of the general text-books on surgery, it is practically never necessary to divide the sphincter for the cure of this condition.

Reference.—[1]*N. Y. Med. Jour.* 1922, July 21, 757.

### FAVUS.

*E. Graham Little, M.D., F.R.C.P.*

An increasing number of cases of favus is recorded as occurring in Canada, and the frequency is explained by the increase of immigrants from Poland since the war. Seventeen cases are reported, in 12 of which fungus was demonstrated, but no attempt at culture seems to have been made, so that the species remains undetermined. Treatment with *x* rays proved successful.

Reference.—[1]*Canad. Med. Assoc. Jour.* 1922, April, 235.

**FEVER, ERUPTIVE, OF CHILDHOOD.** *Frederick Langmead, M.D., F.R.C.P.*

David J. Levy,[1] and also B. S. Veeder and T. C. Hempelmann,[2] describe what appears to be a new exanthem, the first writing from Detroit, the others from St. Louis, U.S.A. Levy has met with about 30 cases, 20 of which were seen before April, 1919. It is a disease of late infancy and early childhood, characterized by a period of high fever, followed by complete defervescence by crisis, and, during the early hours of the post-febrile stage, by the appearance of a macular eruption. It has affected both sexes equally, and occurred practically exclusively in babies of from eight to thirty months, chiefly in the second year. No definite seasonal variation has been noted, nor has it occurred during any epidemic of some other infection. Most of the cases were sporadic, though a few were grouped in a manner suggestive of small epidemics; no case could, however, be traced to another, and no two occurred in one household. The incubation period or any specific etiology therefore remains undetermined.

SYMPTOMS.—The fever occurs suddenly in a previously healthy baby, is generally between 103° and 104° F., and tends to remain between these temperatures and 105° and 106°, without intermission and with very moderate remissions, for from seventy-two to ninety-six hours. Upper respiratory tract symptoms are lacking, but there is reddening of the buccal mucous membrane and a diffuse uneven reddening of the posterior part of the hard palate. A mild pharyngitis without exudation occurs. The posterior cervical glands are palpable as in German measles. Crisis takes place on the fourth day, and thereafter the child appears as well as before his illness. A few hours later the eruption follows, affecting first the trunk and afterwards extending rapidly, particularly to the back of the neck and scalp, only a few lesions occurring on the face or limbs. It consists of pale rose-red irregular macules, discrete save for very occasional grouping of a few of them. There is no itching; the rash has generally gone within forty-eight hours, and is not followed by desquamation. Slight leucopenia has been the rule.

The only sequel noticed has been a suppurative cervical adenitis in one case; and the prognosis would appear to be uniformly good, with complete and uninterrupted recovery. Levy acknowledges its resemblance to rubella, and prefers to consider it an anomalous form of that disease until its specificity is proved beyond cavil. The distinctions he makes are the prolonged period of fever, the crisis, the non-confluent eruption, the absence of desquamation, its failure to attack older children, and its low contagiousness.

The description by Veeder and Hempelmann, who write from 20 cases, tallies closely with that of Levy; they, however, state that there is no lymphatic gland enlargement, and record a relative lymphocytosis in addition to the leucopenia. They regard the disease as identical with that described by Zakovsky in 1910 as 'roseola infantilis', and in 1913 as 'roseola infantum'; but since the term has been used in older text-books to cover an indefinite exanthem, they suggest the name 'exanthem subitum'.

A final judgement on these cases must be postponed, especially in view of the great variability of rubella.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1921, Dec. 3, 1785; [2]*Ibid.* 1787.

**FISTULÆ, RECTAL.** (*See* RECTAL FISTULÆ.)

**FOOD POISONING: BOTULISM.** *Joseph Priestley, B.A., M.D., D.P.H.*

The deadly outbreak of food poisoning at Loch Maree during the summer of 1922 has drawn attention to what may be regarded as the pioneer germ in food poisoning cases, viz., the *Bacillus botulinus*, which was first isolated by Van Ermengem, a Belgian, in 1896, from ham in sausage making. Hence, the germ was christened *botulinus* (the word being the Latin for sausage), and the disease, to which the germ gave rise indirectly, *botulism*. Fortunately outbreaks have been very rare, but some have occurred in England and America, though on the Continent of Europe they have been much more frequent. The germ is anaerobic, and generates the toxin by acting only upon proteid matter (animal or vegetable). Those who partake of it are infected, not by the actual germ, but by the resultant toxin produced from the proteid matter upon which it feeds, and the illnesses are known as 'intoxications', the symptoms being uniform in character, owing, no doubt, to the nervous system in the upper portion of the spinal cord and the cerebellum being chiefly affected.

These symptoms may be tabulated as follow : weakness, headache, dizziness, followed by diplopia, partial ptosis of both eyelids, dilated pupils (which afterwards fail to react to light), paralysis of facial muscles (lower), larynx, and pharynx—the two last-named causing the characteristic aphonia and dysphagia, ending in terminal paralysis of the respiratory centre in the cerebellum with implication of the vagus cardiac nerves and death. There is also stasis of the intestines, giving rise to constipation. Nausea and vomiting may be present in the very early stages of an attack, but are frequently absent. The cerebrum (or brain itself) is never affected, so that victims are conscious to the last. The temperature remains normal or subnormal throughout, and no pain is complained of.

The incubation period of the poison or intoxication-agent is sixteen to thirty-six hours after ingestion of the infected or poisoned food, which, though generally sausage or ham, may also be cottage cheese and corn, or vegetables and fruits such as asparagus, salad, beans, spinach, ripe olives, etc. Turkey, chicken, and fish have also been blamed by different investigators. The difficulty in proving the actual media is well known. For the consolation of the layman, it may be stated that existing statistics prove that, during a period of twenty-two years, only about 150 people have been 'intoxicated' through the toxins caused by the *B. botulinus* (and only 111 have died) out of a total of (approximately) 100 millions of people !

In the Loch Maree outbreak, 100 per cent of those attacked died, and the medium through which the toxin was carried was potted food or paste in sealed jars. It is the first recorded outbreak in Britain of this type of food poisoning, so that it would be manifestly absurd to condemn the use of all tinned or canned or earthenware-jarred food (meats, vegetables, fish, or fruits). The poison is not self-generated, but the result of direct inoculation of the food before tinning or canning or earthenware-jarring.

## FRACTURE OF NOSE. (*See* Plastic Surgery.)

## FRACTURES. (*See* Bones and Joints, Surgery of.)

## FURUNCULOSIS.

*E. Graham Little, M.D., F.R.C.P.*

Lazarus[1] recommends injecting boils with a 5 per cent solution of **Camphor in Oil**, and dressing with the following ointment :—

| | | | | |
|---|---|---|---|---|
| ℞ | Acid. Phenol. | ♏x | Zinc. Oxid. | ʒj |
| | Ext. Ergot. | gr. v | Lanolin. | ℥j |
| | Resorcin. | gr. x | | |

Covering this ointment a small sterile dressing is applied, and held in place with a bandage instead of adhesive strappings, which have a tendency to produce irritation of the skin and perhaps favour the advent of other furuncles. This dressing is not disturbed for at least two days, when the boil is redressed and reinjected if found necessary, and the salve again applied. Usually, however, at the termination of this second dressing no further injections are necessary, except that the use of the ointment is continued until the entire boil has disappeared. Should a core be present at any time of the treatment, it will be removed very easily by this method.

Spaar[2] has a somewhat belated paper in praise of **Vaccines** in furunculosis and staphylococcic infections. He used stock cultures, and in a case of very severe furunculosis gave doses of 100, 250, and 500 million respectively, separated by 48-hour intervals. He used this same method in ten other cases. No rise of temperature occurred, even in cases with only 24-hour intervals between the first and second dose. He comments on the usefulness of the method, especially in persons exposed to risk of reinfection, for a certain degree of immunity is conferred in addition to the clearing up of the individual attack.

*Furunculosis in Infants.*—Grulee and Rose[3] recommend the use of local antiseptic dressings, combined with the application of **X Rays** (3 ma., 6-in. spark-gap, 9-in. focal distance, no filter, one minute exposure, soft tube; and a second method: 6 ma., 9-in. spark-gap, 4-mm. aluminium filter, 9-in. focal distance, one minute, hard tube). The author on the whole prefers the soft-ray treatment. The dressings recommended are thus described: The furuncles are opened as they appear, before and after which the skin is very thoroughly cleansed with 50 per cent alcohol. Moist applications of 50 per cent **Alcohol** are applied frequently thereafter, and the children are given 1–10,000 **Mercuric Chloride Bath** if the condition is at all extreme. In this method a great deal depends on careful and continued observation of the case, and attention to the individual furuncles as rapidly as they develop.

*Furuncle of Lip.*—Lanz[4] contributes some experiences of his in Kocher's clinic, with cases of this formidable condition. Incision is apt to be followed by fatal results, and it is recommended to attempt treatment with conservative methods, the patient being kept in bed, and warm **Salicylic Compresses** kept on the part. If incision is necessary, the necrotic centre of the furuncle should be treated with the thermocautery, and the open blood-vessels seared. Rubber gloves should be worn by the surgeon to prevent infection of his own hands.

REFERENCES.—[1]*N.Y. Med. Jour.* 1921, Nov. 16, 609; [2]*Münch. med. Woch.* 1921, Sept. 9, 1149; [3]*Jour. Amer. Med. Assoc.* 1921, July 2, 37; [4]*Surg. Gynecol. and Obst.* 1921, 14 (abst.).

## GALL TRACTS, SURGERY OF.

*E. Wyllys Andrews, M.D., F.A.C.S.*

**Choice of Operation.**—The question of *cholecystectomy* versus *cholecystostomy* is still being argued, and an enormous amount of literature appears each year on the subject. In most clinics at the present time the gall-bladder is being removed in a very high percentage of cases. Parham[1] presents some excellent reasons for believing that we are going too far in this respect, and that the pendulum is beginning to swing the other way. As he points out, the gall-bladder is not a functionless organ. Its storage capacity, while not large, is very markedly increased by its ability to concentrate the bile, and by this means a far from negligible amount of bile is held ready for instant use. Regulation of the biliary flow is another important function. It delivers the bile into the intestine at the precise moment in which it is needed. The mechanism provided to accomplish this is a very delicate one, and is totally destroyed by cholecystectomy. The protective power of the mucus which the gall-bladder secretes into the bile is also considerable. Harer, Hargis, and van Meter[2] have made studies on the function of the gall-bladder. Removal of the glands along the ducts caused obstruction of the lymphatics and marked dilatation. This enables a better study of these structures to be made. This plexus is very rich. Considerable evidence is brought forth to prove that the absorption of water by the gall-bladder is accomplished largely by these lymphatics. Injection of chemicals into the gall-bladder showed that absorption resulted with great rapidity, and that substances were quickly brought down into the region of the head of the pancreas. These investigators, like all other experimenters, failed to demonstrate any mechanism for emptying the gall-bladder. This is probably accomplished by pressure from adjacent organs, and more specifically by the milking action of peristalsis in the duodenum.

MacCarty and Jackson[3] and Judd[4] call attention to the gall-bladder as a source of infection of adjacent viscera. The relation of the pancreas to biliary infection is well understood, but secondary hepatitis has not received the attention it deserves. In chronic cholecystitis the finding of enlarged liver is very common. MacCarty made sections of excised bits of liver in such cases, and found definite inflammatory changes in 81 per cent. This consisted mainly of a round-cell infiltration about the smaller bile-ducts. In more marked cases fibrosis was noted, and extension of the process into the lobules of the liver with degenerative changes in the liver-cells. Such findings emphasize the importance of early surgery in these cases. Drainage of bile at the time of the operation is also suggested.

The technique of these operations has been so perfected that few improvements are noted. [I read with pleasure, however, O'Conor's[5] description of his technique, in which he stated that he began at the fundus in doing a cholecystectomy. Although this is not my routine in simple cases, I believe that it should always be the practice where difficulties are encountered in the form of dense adhesions and altered anatomical relations. If this were done, there would be a much less voluminous literature on methods of reconstructing the common duct.—E. W. A.].

Willis[6, 7] has resurrected an old operation which would seem to have a great value in certain cases. This is *cholecystotomy.* It is especially adaptable to patients of advanced age who suffer from cholelithiasis but whose gall-bladders are little if at all diseased. Under such conditions removal of the gall-bladder is of course the ideal operation, but it is liable to be rather dangerous. Infection being slight, there is no indication for drainage, and drainage may even be distinctly harmful, as these patients do not tolerate loss of bile well. Willis simply makes a small incision near the fundus of the gall-bladder, removes the stones, and closes with two layers of fine catgut. The inner row of stitches includes the submucous and muscular layers, but does not extend through the mucosa. Thus no suture material is exposed to the bile to act as a focus for stone formation. The outer row is of Lembert stitches and includes little except the peritoneum. This operation was abandoned many years ago because intraperitoneal leakage of bile occurred in so many cases. Should the technique of Willis prove to have overcome this danger, it will be a distinct addition to the means at our command.

*Cholecystgastrostomy* both as a palliative and as a curative operation, is at times of great value. Mastrosinome,[8] Delore and Wertheimer,[9] and Heyd[10] report series. All agree that this is the procedure of choice over any other form of entero-anastomosis. There can be no doubt that bile in the stomach is well tolerated. Not a single patient showed symptoms referable to this point. Normally there is considerable reflux of bile from the duodenum into the pyloric region of the stomach. Theoretically the duodenum would be the more physiological point for the anastomosis, but considerable technical difficulties often make it impossible. The duodenum is more fixed, angulation is liable to occur, suture of its wall is more difficult, and finally it is often compromised by the pathology necessitating the anastomosis. The indications for cholecystgastrostomy are: (1) *Cancer of the pancreas,* obstructing the common duct. The results here are brilliant, though temporary. Jaundice disappears, and a marked improvement in the general condition of the patient is noted. Life is lengthened by several months or even years. These patients do not do nearly so well after cholecystostomy. Rapid emaciation and death from acholæmia generally ensue. Of considerable bearing on this point is the fact that differential diagnosis between malignancy in this region and stone or inflammatory mass is often impossible even at the operating table. Many cases of this type surprise the physician by making a permanent instead of temporary recovery. (2) *Stone in the common duct.* Especially in the aged, or in subjects of low vitality, cholecystgastrostomy offers a much safer method of relief than the difficult and tedious choledochotomy. (3) *Biliary fistula.* If the condition of the gall-bladder warrants it, anastomosis with the stomach may be done in preference to the difficult and dangerous dissection often necessary to expose the common duct and relieve its obstruction. (4) Certain cases of *recurrent cholecystitis* and cholangitis (Heyd). Biliary cirrhosis arising from such causes is well known. (5) As a cure for the *hyperchlorhydria of gastric ulcer*, as suggested by Babcock.[11]

Fullerton[12] suggests that if the gall-bladder be thickened or obviously diseased it may be partially removed and the stump implanted into the stomach. He reports one successful case. There was a definite pancreatitis and a markedly diseased gall-bladder. He did not wish to remove the gall-bladder entirely, as that meant the destruction of the easiest method to drain the pancreas. The distal part was therefore removed, and only enough left attached to the cystic duct to make the anastomosis. This procedure has obvious advantages over the more difficult anastomosis of the stomach and the cystic duct.

**Drainage after Operations on the Gall Tracts.**—This question is still the subject of much discussion. Richter,[13] one of the most enthusiastic advocates of closure after cholecystectomy, has now gone further and omitted drainage after choledochotomy. This cannot be done in all cases by any means. In order to do it with safety, we must assure ourselves: (1) That the peritoneal coat is not so destroyed in the operative measures as to render it useless; (2) That suture materials and needles are of the finest size; (3) That no stones are left behind or stricture is overlooked; (4) That the diameter of the duct is sufficient to permit of two lines of sutures, with ample room to allow for the traumatic swelling that is to be anticipated; (5) That the walls of the duct are not too rigid or infiltrated to permit of free manipulation; (6) That there is no jaundice or acute infection.

Buchbinder[14] regards the burial or peritonealization of the stump of the cystic duct as a mistake. If drainage is omitted, the serosa is much better able to combat any latent infection lurking in this stump than are the retroperitoneal tissues. These are loose and areolar, and contain many large veins as well as other important structures. One of the main functions of the peritoneum is that of overcoming infection, which is certainly not true of areolar tissue in any location.

Others as a rule have been more conservative about the omission of drainage. The two main exponents of closure in America—Willis and Richter, and Haberer in Germany, have certainly accomplished much good even if their recommendations are not accepted *in toto*. The use of gauze tampons and excessive amounts of drains has largely disappeared. Reise,[15] Hollenbach,[16] and Fink-Finkenheim[17] all discuss the subject. Cases of leakage of the cystic stump are cited which might have had disastrous sequelæ had the abdomen been closed. They have all abandoned the use of gauze except where absolutely necessary to control oozing from the gall-bladder bed. [I believe that the idea of most surgeons is that drainage would not be necessary in a vast majority of cases, but for the few in which leakage occurs they prefer to have an avenue of escape left open. Small guttapercha or thin rubber sheeting will provide such an exit, and will not be the cause of extensive adhesion formation.—E. W. A.]

**Operations in Presence of Jaundice.** Walters[18] points out that most of the deaths in such operations result from hæmorrhage. In his series the coagulation time was over nine minutes in nearly every case. For increasing the coagulation time calcium salts are of great service. Given by mouth they are absorbed very slowly and have very little influence on the coagulability; intravenous injection has proved to be much more efficacious. As a preoperative measure 5 c.c. of 10 per cent calcium lactate solution should be given intravenously daily for three days. Another factor is that in obstructive jaundice it has been shown that the body store of calcium is depleted and that the calcium is used up to combine with and neutralize the bile acids circulating in the blood. For this reason calcium salts can be shown to have a decided detoxicating effect. Large amounts of water will dilute these poisons and aid in their elimination, and therefore fluids should be forced, by mouth, rectum, or hypodermically if necessary. Increased carbohydrate metabolism is known to act as a protective agency for the body proteins in this form of toxæmia. Sugar and starches by mouth, and proctoclysis, are thus indicated. Crile,[19,20] in a discussion of this subject, agrees with these suggestions, and adds several more. Ether or any other narcotic acts by preventing oxidation in the tissues, that is, by causing a tissue asphyxia. The cells of the liver are already in a similar condition owing to the action of the bile salts, and the sum of the two is often more than can be tolerated. Complete loss of function of the liver-cells is liable to result, a condition described as 'liver shock'. For this reason all operations should be done under local anæsthesia. Thermocouple experiments have shown that the internal temperature of the liver is much lowered in this form of intoxication, and for this region the application of external heat is recommended. Both authors emphasize the value of blood transfusion.

References.—[1]*Surg. Gynecol. and Obst.* 1922, April, 550 ; [2]*Ibid.* March ; [3]*Minnesota Med.* 1921, iv, 377 ; [4]*Jour. Amer. Med. Assoc.* 1921, July 16 ; [5]*Lancet*, 1922, April 22 ; [6]*Jour. Amer. Med. Assoc.* 1922, April 1 ; [7]*Surg. Gynecol. and Obst.* 1922, Feb. ; [8]*Ibid.* 1921, Dec., 460 (abstr.) ; [9]*Rev. de Chir.* 1921, xl, 400 ; [10]*Jour. Amer. Med. Assoc.* 1921, July 30 ; [11]*Amer. Jour. Obst. and Gynecol.* 1921, May ; [12]*Brit. Med. Jour.* 1922, June 24 ; [13]*Surg. Gynecol. and Obst.* 1922, Feb. ; [14]*Jour. Amer. Med. Assoc.* 1921, July 23 ; [15]*Deut. med. Woch.* 1921, Sept. 15 ; [16]*Zentralb. f. Chir.* 1922, June 24 ; [17]*Ibid.* 1921, June 30 ; [18]*Surg. Gynecol. and Obst.* 1921, Dec. ; [19]*Ibid.* Nov. ; [20]*Illinois Med. Jour.* xxxix, 401.

## GASTRIC ANALYSIS, THE PRESENT POSITION OF.

*Robert Hutchison, M.D., F.R.C.P.*

There can be no doubt that less diagnostic importance is now attached to the results of the chemical examination of a test meal than was the case a decade or more ago. Nor has the introduction of the 'fractional' method (described in last year's Medical Annual, p. 174) done much to improve the position ; indeed, in the opinion of many it has only made confusion worse confounded. In any case the fractional method is not capable of being generally used in practice. It is too troublesome and time-consuming. It has also been shown by Gorham,[1] Wheelon,[2] and Kopeloff[3] that the gastric chyme is not a uniform mixture, and that small samples of it do not necessarily represent the composition of the whole stomach contents. This objection is perhaps more theoretical than practical, and Lockwood and Jacobson,[4] whilst finding moderate variations in different samples taken at the same time, yet conclude that the method does, in the majority of cases, give fairly accurate information. More important is the fact established by Kopeloff[3] that several 'curves' taken in one week from the same individual under identical conditions may differ radically one from another. Further, owing to the absence of a 'standard' test meal, the curves obtained by different workers are not fairly comparable (Knapp[5]), whilst the small samples obtained do not permit of accurate or complete analysis. It is therefore not to be wondered at that there is a tendency to revert to the use of the old-fashioned Ewald test meal, in which the entire contents of the stomach are drawn off at the end of an hour, supplemented by an examination of the fasting contents twelve hours after the taking of a meal containing an indigestible residue (e.g., currants).

That the results of the 'fractional' and 'single' meal methods are closely comparable has been shown by Wheelon,[2] who found that in thirty-one normal young men the average total acidity by the single-meal method was 45, and the free acid 29 ; whilst the average figures for the entire titrations in twenty men examined by the fractional method were total acidity 45 and free HCl 25. He considers that as much information as to secretory power is given by the one method as by the other.

The decline of confidence in the test meal, however, is due not so much to difficulties of method as to uncertainty in the interpretation of results. In the first place, it has now been clearly shown by the observers of the Guy's school[6] and others, that there is no type of acidity in disease which is not also met with in apparently quite normal individuals. Thus degrees of superacidity as high as those met with in, say, cases of duodenal ulcer, are not very uncommon in health, whilst complete anacidity (achylia) in young healthy adults "is about as common as red hair" (Bennett and Dodds[7]). Rehfuss also states that there is "no pathognomonic curve in any gastric condition".

Further, it has come to be realized, largely as the result of using the fractional method, that the 'acidity' of the contents at any given moment is not a direct expression of the activity of secretion, but is, on the contrary, the resultant of several different factors. There is reason to believe, indeed, as Boldyreff[8] has shown, that the gastric juice *as secreted* has a uniform acidity of about 0·5 per cent ; and Carlson and Rosemann[9] call attention to the fact that there is no evidence that the glands can secrete HCl in greater concentration than this, although they may possibly sometimes produce a weaker juice. If this be true, 'superacidity' in the strict sense does not exist. The strong gastric juice appears to be reduced to an acidity of about 0·2 to 0·15 per cent, which is the optimum for good digestion, by a process of dilution largely brought about by automatic regurgitation through the pylorus—a process which has been specially studied by Bolton and Goodhart,[10] though neutralization by the food, by the saliva, and by the secretion of the pyloric end of the stomach, also plays a part. It follows from all this that neither 'hyperchlorhydria' nor 'achylia' can any longer be regarded as a 'clinical entity', but are merely terms expressing a condition of the gastric contents which may be the result of an excess or defect of secretion, or a failure or surplus of dilution, as the case may be.

The results of an examination of the 'resting secretion' of the stomach are equally difficult of interpretation. It was at one time supposed that the presence of *any* juice in the stomach twelve hours after a meal was pathological. It has now been shown, by experiments on healthy men, that the normal resting stomach may yield up to 80 c.c. of juice, although it varies as regards both quantity and acidity, not only in different individuals, but in the same individual at different times. All are agreed, however, that a yield of above 80 or, at most, 100 c.c. of resting juice is pathological, and may be due either to hypersecretion or to delayed emptying. The presence of food residues is, for practical purposes, pathognomonic of organic stenosis of the pylorus.

It has been claimed for the fractional method that it enables us to estimate the motility of the stomach by the rate of emptying, and this is true, though the same information can be obtained by a radiograph. Here again, however, we are without a normal standard, for it has been demonstrated by the Guy's observers, who on this point are in emphatic disagreement with American writers, that the normal rate of emptying shows great variations in different subjects, and in the same subject at different times. It appears to be only the grosser defects of motility about which there can be any certainty, and these can usually be inferred on clinical grounds.

The conclusion of the whole matter would appear to be that the inferences to be drawn from gastric analysis are purely empirical. Experience has shown that, as a matter of fact, certain diseases are associated *in the main* with certain types of acidity. Thus duodenal and pyloric ulcers tend to show high acidity with a large amount of 'resting juice'; carcinoma, though with many exceptions, a low acidity, and so on. A large amount of resting juice with a high proportion of free HCl is associated with hypersecretion or delayed emptying, whilst the finding of food residues is the final proof of pyloric stenosis. The presence in it of blood, mucus, or pus may also be of diagnostic import. A test meal, therefore, can never finally decide a diagnosis. It only supplies evidence, which has to be given due weight along with the clinical and radiographic findings, in coming to a decision. For this modest purpose the old 'single' type of test meal appears sufficient, though for the study of gastric physiology the fractional method has the greater value.

In view of the uncertainties of the test meal above described, attempts to arrive at the real secretory work done by the stomach have been made by other methods, such as an estimation of the hydrogen-ion concentration in the contents.[11] Dodds[12] has recently employed an analysis of the alveolar air taken at intervals after a meal for the same purpose. He finds that the tension of $CO_2$ varies with the secretion from the stomach and pancreas. This method gives an index of the total amount of acid or alkali secreted from the blood, and is independent of the neutralizing factors. It also evades the psychical disturbance of secretion caused in sensitive patients by the passage of a tube. Whether the method will prove of clinical utility remains to be seen.

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## GASTRIC CRISES. (*See* SPINAL SURGERY.)

## GASTRIC AND DUODENAL ULCER.

*Robert Hutchison, M.D., F.R.C.P.*

There has been no real advance in our knowledge of these conditions in the past year, but the present review may help to show the trend of recent opinion on some points.

ETIOLOGY.—The causation of peptic ulcer in the stomach or duodenum is still quite obscure. There is a tendency noticeable in recent writings to take rather a pessimistic view and to speak of an ulcer 'constitution' or 'diathesis', meaning, it is to be presumed, an inborn tendency to ulcer formation which is essentially incurable. Thus one writer[1] goes so far as to say that the surgical treatment of ulcer is 'analogous to the amputation of a leg in diabetic gangrene': that is to say, it only gets rid of the local manifestation of a constitutional state. It may be said at once that the existence of an 'ulcer constitution' has been far too hastily assumed. After all, though a chronic ulcer may break down again and again, it is *not* very common for fresh ulcers to form, especially after surgical treatment. Although the part played by the acid of the gastric juice in aiding the formation of ulcers is now regarded as of less importance than it used to be, there can be little doubt that, in the case of duodenal ulcer at least, superacidity is a factor in ulcer development, and a gastro-enterostomy does, in the majority of cases, permanently lower acidity, and in so far may be regarded as modifying one feature of the ulcer 'constitution'. On the other hand, it has now been clearly shown that even the most thorough medical treatment fails usually to alter the acidity in any way, not only permanently, but, in some cases at least, even during the treatment.[2] This makes it easy to understand why an ulcer should break down again after such treatment.

Another tendency of recent opinion is to stress the factor of 'focal sepsis' in the etiology of peptic ulcer. This also is a view founded upon very little definite observation. As a matter of fact there is no reason to believe that focal sepsis is commoner in ulcer patients than in others. By all means let us remove such foci in the interests of the patient's general health, but do not let us expect too much from the procedure in the way of curing or preventing gastric or duodenal ulceration. Acute ulcer, as is well known, is commonest in young women; chronic gastric ulcer occurs with nearly equal frequency in both sexes in the middle period of life; whilst duodenal ulcer mainly affects men. Until we have a theory which will account for these simple clinical facts it will be best to confess our ignorance, and not to base any treatment upon a hypothetical view of causation.

Diagnosis.—There is still general concurrence of opinion that a careful clinical history is of most value in diagnosis. Much less importance than formerly is now attached to the evidence furnished by test meals; but it is agreed that superacidity is strongly corroborative in a case of suspected *duodenal* ulcer. In a gastric ulcer near the pylorus, high acidity is to be expected; but if the ulcer is situated elsewhere in the stomach the acidity may be normal. Recent work has also shown that the highest acidities met with in disease may be matched by those sometimes found in perfectly healthy persons. (*See* Gastric Analysis.)

Whilst the test meal has been gradually falling into something almost like disrepute, radiology, as an aid in the diagnosis of gastric ulcer especially, has steadily improved its position. As Barclay[3] points out, however, three things are essential for trustworthy results: (1) a thoroughly trained observer, (2) a really efficient apparatus, and (3) a reasoned routine method that includes a careful visualized palpation, particularly in the upright position. It will be generally admitted that these desiderata are often not forthcoming.

The signs of ulcer yielded by radiography are either direct or indirect. The demonstration of the actual break in the outline of the shadow caused by an ulcer is the direct evidence on which a definite opinion can be based, and in skilled hands such evidence is becoming more and more frequent. The indirect evidence of ulceration is furnished by such indications as spasmodic contractions, definite point of pain, character of the peristalsis, rate of emptying, etc., all of which are liable to misinterpretation. The diagnosis of duodenal ulcer depends on establishing the fact that the duodenum is definitely and persistently deformed. Vilvandré[4] attaches importance to what he calls 'focal tenderness' in the *x*-ray diagnosis of gastric ulcer. It is determined by palpating with one finger along the whole of the lesser curvature whilst the patient is in the upright position. Definite pain is elicited when the pressure reaches the point at which an ulcer is situated.

The conclusion of the whole matter seems to be that the *x*-ray diagnosis of ulcer is not yet infallible, and that the evidence of the radiologist has to be co-ordinated with the clinical history and symptoms as well as with the results of the test meal. Even when all this has been done, the diagnosis may still be in doubt, and in the last resort an exploratory laparotomy is the only certain arbiter. (*See also* X-RAY DIAGNOSIS.)

TREATMENT.—The conflict of opinion as to the relative merits and scope of non-operative and operative treatment in gastric and duodenal ulcer which was referred to in last year's MEDICAL ANNUAL still persists. Most writers advise that medical treatment should always be tried first, and that, if it fails, recourse should be had to operation. Provided one sees the patient early in the development of the disease this advice seems sound; but the longer the ulcer has been in existence, the less likely is medical treatment to succeed; and if it has led to deformities of the stomach, or to obstruction at the pylorus, operation is always indicated. In any case, medical treatment, if it is to have a proper chance, must be prolonged and thorough (more or less on the lines described in the ANNUAL for 1921, p. 209), and it is well to realize that it will keep a patient as long off work as an operation, and will entail years of care in the after-treatment. That gastric ulcers can heal under such treatment there is no doubt, and radiographic evidence of the disappearance of the ulcer 'niche' has been brought forward by Diamond,[1] Shattuck,[5] and others. How long they *remain* healed, however, is another question, and one which neither of the papers above referred to enables us to answer.

Advice for or against operation must also be affected by the view one takes as to the danger of an ulcer becoming malignant. In the case of a duodenal ulcer all are agreed that there is no such danger at all; but as regards gastric ulcer there is still a remarkable divergence of opinion. Thus, in a recent discussion at the Royal Society of Medicine[6] we find an experienced surgeon (Mr. Sherren) stating that 'gastric ulcer is definitely a pre-cancerous condition', whilst a physician (Dr. Soltau) asserts that 'cancer is very rarely preceded by ulcer'. If the surgical view on this point is right, it is a strong argument for operation. Nor is there agreement about the treatment of bleeding from an ulcer. In the discussion referred to above, for instance, a physician (Sir W. Willcox) says that death from hæmorrhage is 'extremely rare', whilst a surgeon (Mr. Carson) asserts that to wait before operating for hæmorrhage 'is to court disaster'. If the writer may express his own opinion, it would be that in bleeding from *acute* ulcer (the so-called 'gastrostaxis' of young women) operation is never called for, but that in bleeding from a chronic ulcer it is much safer to operate, if necessary after transfusion. There is no doubt that hæmorrhage from a chronic ulcer, gastric or duodenal, *is* often fatal.

Glaessner[7] recommends **Caustic Soda** in the treatment of gastric or duodenal ulcer. It acts, he believes, not only as an antacid, but by arresting ferment action and slightly cauterizing the ulcer. He gives 2 oz. of a 0·2 to 0·4 per cent solution of NaOH in peppermint water every two hours. No special diet was observed, and the patients were not kept at rest. Of 15 undoubted cases of ulcer treated by this method, 12 were still free from symptoms after more than six to ten months.

REFERENCES.—[1]Diamond, *Amer. Jour. Med. Sci.* 1922, April, 548; [2]Crohn and Reiss, *Ibid.* 1920, Jan.; [3]*Lancet,* 1922, i, 219; [4]*Ibid.* 1047; [5]*Jour. Amer. Med. Assoc.* 1921, Oct. 22, 1311; [6]Reported in *Lancet,* 1922, Feb. 4 and 11; [7]*Wien. klin. Woch.* 1921, Nov. 24, 567.

## GASTRIC AND DUODENAL ULCER (Surgical Aspect).

*E. Wyllys Andrews, M.D., F.A.C.S.*

The great question before the surgeon operating upon a case of gastroduodenal ulcer to-day is: "Shall I be content with a simple gastro-enterostomy, or is some more radical procedure indicated?" The answer, of course, lies in the relative mortality of the two procedures and the relative number of cases cured.

As to the mortality, it stands to reason that the various types of excision and partial gastrectomy will cause more immediate post-operative deaths. De Quervain[1] has wisely pointed out that most of the mortality after gastric surgery is due to chest complications, pneumonia, and embolism. The more extensive the manipulation and the longer the duration of the anæsthesia, the higher the percentage will be. Figures from many clinics show that simple gastro-enterostomy kills from 2 to 4 per cent of patients, and gastrectomy from 3 to 7 per cent, the difference being from 1 to 3 per cent. Although, he says, they never will be the same, a judicious choosing of cases may make them very nearly so. If the more radical operations are reserved for cases in good condition, and in whom no great technical difficulties are anticipated, they can be carried out nearly as safely as the simpler ones.

It is well recognized that gastro-enterostomy alone will not cure anything like 100 per cent of ulcers. De Quervain says 80 per cent; Mayo[2] 70 per cent; Cheever[3] 60 per cent. Probably the latter figure would represent the opinion of a majority of surgeons. As pointed out elsewhere in this review, jejunal ulceration is very common. Conybeare[4] and many others have shown that while the acid is generally reduced, this is by no means always true, and it may even be increased. Thus, in the opinion of most of us, simple gastro-enterostomy is not adequate.

It remains to be proved, however, if any of the more radical procedures give better results. The simplest of these is the cautery excision of Balfour.[5] This has many advantages, and offers considerable hope. Much of the danger of hæmorrhage is obviated; the excised area can be much smaller than if a knife is used; in the duodenum, where the ulcers are small, a single cautery puncture is made; dangers of early malignancy are lessened; finally, the mortality is little if any more than simple gastro-enterostomy. Follow-up statistics appear to show 80 per cent of cures. Probably we can affirm that it is sure to cure the ulcer, but of course this is no guarantee against further ulceration.

Many of our greatest surgeons are now practising resection of the ulcer-bearing area as a routine, and have come to the conclusion that it is the operation of choice. Many different methods are in use. Billroth II, Polya, Balfour, and other operations each have advocates. Sleeve resection is in favour among German surgeons (Haberer[6]). Brütt,[7] in a very elaborate monograph, advocates it enthusiastically. Soresi[8] describes a new method of partial gastrectomy. It consists of closing the stomach stump according to the Mikulicz method, and attaching the jejunum 'en Y' according to Roux. Moynihan,[9] De Quervain,[1] and many others now favour gastrectomy. Kaiser[10] and Ostermayer[11] discuss the use of another procedure, resection of the lesser curvature. The anterior wall is excised more widely than the posterior.

All the above report much better results from these operations than from gastro-enterostomy. The ulcer-bearing area is removed, and recurrence is much less likely. Acid-secreting mucosa is lessened and another dangerous factor got rid of. Finally, the spectre of cancer is banished. Studies of these patients after several years seem to prove that the results are better. In spite of this, conservatism still has many advocates, and in probably the majority of clinics resection is not practised as a routine.

[In the opinion of the reviewer an important feature of the problem has been but little dwelt upon. Most of the difficulties after gastro-enterostomy—jejunal ulcer, hyperacidity, failure of original ulcer to heal—are due to hyperacidity. This acid is much easier to control after operation than before. A prolonged course of post-operative alkalinization will remove many of the objections to this operation. Since I have insisted on this point with my patients, I feel confident that the improvement in the results has been marked. Thus one is enabled to avoid the more dangerous types of surgery and accomplish as much. Another observation I would like to make is that, although more radical work has but slightly higher mortality in the hands of a few surgeons of wide experience, quite a different tale might be told if it became common practice among the less skilful.—E. W. A.]

## PERFORATING ULCER.

To illustrate the utterly chaotic state of our conceptions as to how to treat perforated ulcers, I am going to quote from but four out of the large number in this year's literature.

Stewart and Barber[12] report 24 cases, of whom but 2 died. Both deaths were in cases of over forty-eight hours' duration. Their surgery consisted of merely closing the perforation and reinforcing the suture line with omentum. The follow-up reports indicate that in most instances the patients are in fairly good health. None were ill enough to warrant further surgery. "These results compare favourably with the chronic ulcer cases upon whom gastro-enterostomy has been performed." They also present considerable experimental evidence to show that puckering or infolding of ulcers about the pylorus does not tend to cause obstruction. Drainage, both local and suprapubic, was employed, and discharge was free. One case not drained leaked between the stitches. Peritoneal irrigation was not carried out.

Courty[13] presents an imposing review of collected series. He concludes that after suture of the perforation, gastro-enterostomy is often necessary because the pylorus is narrowed. In some cases the ulcer cannot be closed because it is too large or too calloused. Then pylorectomy is indicated. Drainage is unnecessary except in the abdominal wall.

Hromoda and Newman[14] (Vienna) advocate resection in all cases. They quote numerous instances of recurrence of symptoms after simple closure of perforations. Their attitude is that one should attempt to produce a permanent cure by resecting the ulcer-bearing area. They report 19 cases, of whom 5 died, but three of the deaths were in very late cases. All the others were completely cured, and "able to eat anything". Drainage was entirely omitted.

Brenner[15] is also of the opinion that closure of the perforation alone is not always sufficient. If the ulcer is hard and indurated, he recommends gastro-enterostomy as well. Drainage, he says, is not only unnecessary but actually harmful. No discharge occurs through a drainage tube as a rule, and fistulæ are liable to occur.

[A study of the current literature reveals the fact that the opinions expressed by each of the above authors have many supporters. The radical attitude of Hromoda is reflected in the writings of numerous German surgeons who now advocate pylorectomy. In America the ultra-conservative methods are perhaps most in vogue, although a considerable number of surgeons there are performing gastro-enterostomy in selected cases, where conditions warrant it.

Personally, I am much inclined to rely on closure alone in most of my cases, for the following reasons: (1) There are practically 100 per cent operative recoveries, if brought to the table before eighteen hours; this is true of no other method. (2) The inversion and suture will surely cure most perforated ulcers; it is a standard treatment for unperforated ones. (3) More radical work can be done later, if needed, with much less risk. (4) Stenosis of the pylorus from our stitching is rare.

As for drainage, the great preponderance of opinion is against it. It is unnecessary because the gastric juices are nearly sterile. In early cases the peritoneum is chemically irritated—not infected. In late cases, of course, it is necessary, but even here the scantiness of discharge suggests its omission. The danger of fistula production, I believe, is a very real one.—E. W. A.]

## JEJUNAL ULCER.

Incidence.—An unusual amount of literature has appeared recently on this subject. Formerly considered a rarity, the number of cases reported now runs into the hundreds. In this, as in many other fields, the modern follow-up system is revealing rather surprising facts.

Lampson[16] noted 3 cases after 147 gastro-enterostomies (2 per cent), and collected 17 after 1028 operations in the literature (1·3 per cent); 55 cases after 4324 operations were reported from the Mayo Clinic (Judd[17]). These figures are probably much below the actual incidence, as many cases must be overlooked on account of the difficulties in diagnosis. Also, as in all unsuccessful operations, the patient is prone to consult some other surgeon. Davis,[18] in a collective review after much correspondence with numerous surgeons, believes that 8 per cent would be a conservative estimate. [This, to my mind, was indeed an astonishing figure, but the evidence is now so complete that denial is difficult. Secondary ulceration must now be looked upon as perhaps the most important cause of failure after gastro-enterostomy. Indeed, the Continental surgeons have recognized this for several years, and have been led vastly to increase the number of partial gastrectomies in their clinics.—E. W. A.]

Etiology.—The rôle played by hydrochloric acid is a leading one. All other factors must be relegated to a purely secondary rank. There is but one case reported of jejunal ulcer after gastro-enterostomy for cancer, when acid is diminished or absent (Judd[19]), (Hurst and Rowlands[20]). Haberer[21] has done 710 partial gastrectomies for ulcer, with not one case of secondary ulceration: in these cases, of course, much of the acid-secreting mucosa is removed. After gastro-enterostomy he found a large number. High acidity, as shown by test meals, is a constant clinical feature of jejunal ulcer.[20] It occurs most frequently of all after operations of the Roux type, where a segment of the bowel is free from the alkaline bowel contents. It is unknown after pyloroplasty. All these facts prove conclusively that the prime factor is the acid gastric juice poured on to a mucosa whose natural habitat is alkaline.

Many other factors have been suggested, but none can be considered except in a purely secondary aspect. Trauma from too tight clamps may have some bearing, but the ulcers seem to occur just as often in clinics where stay sutures are used in place of clamps. Judd[19] tells us that, in 26 out of 101 cases of secondary ulceration operated at the Mayo Clinic, unabsorbable suture material was found hanging at the edge of the ulcer. This is suggestive, of course, but such a factor cannot produce ulceration in the absence of acid. The spread of infection from the original ulcer must be considered, but many cases of jejunal ulcers are known where no primary ulcer could be found, and Moynihan[22] reports two in which the original operation was for prolapse.

Diagnosis.—This is extremely difficult, and must be made largely by inference. The patient is usually relieved of symptoms for several months by the gastro-enterostomy. This is true in a great majority of cases, and helps considerably, as it enables one to rule out other types of vicious circle in which there is usually no relief. Gradually all the old pains return, along with vomiting, and blood in the stools. The pain is often much worse than in gastric or duodenal ulcer, and is rather capricious, not having such definite time relations. It is felt more on the left side. There is, however, so little difference between the two pictures that a differentiation is practically impossible. It is only in the last few years that we have learned that, in the vast majority of patients presenting this picture, the cause was secondary and not primary ulceration.

Treatment.—It is generally acknowledged that gastroduodenal ulceration is primarily a medical disease, and surgery is only indicated where diet and medicine fail. This is all the more true in secondary ulceration, where the acid is so evidently the prime factor. In gastric ulcer, although acidity is certainly important, it alone cannot cause ulcers. Acid alone can cause jejunal ulcers. These theoretical facts correspond with the reviewer's clinical experience that these cases respond well to medical management. He believes that as a prophylactic measure it is important that, after all gastro-enterostomies on patients with a chronic hyperchlorhydria, a prolonged course of alkali medication is indicated.

Surgically, the problem is a difficult one, and no hard-and-fast rules can be laid down. All depends on the conditions found. First, the stoma must be disconnected, no matter what else is undertaken. If the ulcer is close to the suture line, it may be excised in performing this step. If located at a distance, a separate incision is made. The reviewer[23] has made the line of separation of the stoma several centimetres on the gastric side, so as to avoid narrowing the jejunum, and noticed no ill results; Webb[24] reports a series of animals in whom this was done, and the transplanted mucosa was found to be in good health five months later.

In a considerable number of cases the pylorus will be found patent and the original ulcer healed. Should this be the case, all that remains to be done is to close the hole in the stomach, and the normal conditions are restored. Should the pylorus be stenosed, or should active ulcer persist, further surgery will be necessary. Deaver[25] recommends pyloroplasty according to the Finney or Heineke-Mikulicz methods in such cases. Undoubtedly this would be the procedure of choice, but unfortunately great technical difficulties often render it practically impossible. If the pylorus is the seat of extensive ulceration and the almost cartilaginous infiltration often seen, plastic work in that region is out of the question. The procedure which comes to our minds first, the creation of a new stoma, has many serious drawbacks. As pointed out by Eusterman,[26] these patients seem to have a most decided susceptibility to jejunal ulceration, and such procedures are almost certain to be followed by relapse. The literature abounds with reports of cases operated upon two, three, or even four times. Therefore, in the opinion of the reviewer, if the primary ulcer exists and the pylorus is too much diseased to work with, we are left no choice but gastrectomy. This is the view of Haberer,[21] and in fact is his operation of choice in all cases. Simple 'sleeve resection', with implantation of the stomach into the jejunum, by any of the standard methods, will usually reduce the acidity to such an extent that danger of secondary ulceration is removed. This seems to be the present status of the problem, and only a single voice is raised against it, Kelling's,[27] who joins issue with Haberer, and has collected five cases of jejunal ulceration following partial gastrectomy. It must be admitted, however, that this is exceptional and cannot change our views.

Complications.—Perforation of the ulcer into the peritoneal cavity may occur. Wright[28] found 31 perforations among 135 cases of jejunal ulcers. Others agree that this type is more liable to leak than ordinary gastroduodenal ulcers. The danger is much greater, as the extravasated material is spread rapidly by the movement of the intestines. Shock is more marked, and the patient is usually in a weakened condition before leakage occurs. Simple suture of the perforation is all that should be attempted, care being taken not to narrow the stoma.

Perforation into the colon—that is, the production of gastrojejunocolic fistula—is another complication which occurs in about 10 per cent of cases. Gosset and Loewy,[29] in an exhaustive monograph, have investigated this subject and collected 76 cases, most of them recent. The infection seems to reach the colon through the transverse mesocolon. Spreading in between the leaves of this structure, the fistula connects with the colon in its extraperitoneal portion. Its prophylaxis consists in careful closure of the mesocolon in performing posterior gastro-enterostomies, and attaching its edges well up on the stomach so that they will not lie against the anastomosis. The symptoms are diarrhœa and rapid emaciation. *X* rays usually reveal the true condition at once. The treatment is only surgical, of course, and an extensive difficult dissection is always necessary.

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## GASTRO-ENTEROSTOMY (DYSPEPSIA AFTER).

*Robert Hutchison, M.D., F.R.C.P.*

A good deal of attention has lately been directed to cases in which abdominal symptoms have persisted or appeared after a gastro-enterostomy. Of many papers on the subject, the most detailed is that of Spriggs and Marxer,[1] which is founded on a careful study of 51 cases. In all of these the operation had been performed by a (presumably) competent surgeon, and in 75 per cent of them there was good evidence of the existence of organic disease prior to the operation; in the remaining 25 per cent, however, the grounds for operation were more doubtful. The symptoms complained of in order of frequency were as follows: pain 26, flatulence or distention 21, weakness 19, constipation 19, wasting 14, vomiting 13, vomiting or regurgitation of bile (not included under preceding head) 8, diarrhœa 11, headaches 11, bleeding (including melæna and two cases showing occult blood on a hæmoglobin-free diet) 9, discomfort (other than pain) 9, nausea (without vomiting) 8, regurgitation (not of bile) 3. Also, in one case each, tetany, cramps, œdema, bad taste, sore tongue, itching, giddiness, depression, nightmares, sleeplessness, neuralgia, and sciatica. *Pain*, if genuine, is practically always due to an organic lesion. It is often the result of the development of a jejunal ulcer, or, more rarely, it may be caused by accumulation in the stomach with spasm, by adhesions, or by gall-stone. Vomiting also has usually an organic cause, such as mechanical interference with the loop.

The other symptoms are more difficult to explain. *Wasting* is mainly due to the patient eating less on account of discomfort, and *not*, as he is apt to suppose, to his not utilizing his food well, though there is some evidence that fats are less well borne and absorbed after a gastro-enterostomy. *Diarrhœa* is generally ascribed to irritation of the bowel from food which has not undergone gastric digestion. While this is probably so, it does not seem to be simply due to food passing too quickly into the bowel, because of the 13 patients who complained of diarrhœa, with *x* rays only 3 showed rapid emptying of the stomach. Moreover, 3 patients in whom material rushed through the stoma with unusual rapidity did not have diarrhœa. More suggestive is the fact that in 3 of the patients who had diarrhœa there was accumulation and delay in the pyloric part of the stomach, beyond the stoma, with possible decomposition of food. Six of the diarrhœa patients showed a subacid gastric juice, 3 a normal acidity, and 1 superacidity. The other symptoms in the above list must be attributed to a disorder in the process of digestion resulting from the operation. Thus a very rapid passage of the food through the stomach seems to be a cause of great discomfort, whilst in others the result follows from the food stagnating in the organ because the stoma has not been made at the most dependent point.

The observations of the writers upon the acidity of the gastric contents in their cases confirm the experience of the reviewer and others that organic lesions such as jejunal ulceration are much more likely to develop in those cases in which superacidity persists after operation, whilst functional troubles are commoner in the subacid cases.

The diagnosis of the exact cause of the patient's symptoms in the cases under consideration is often very difficult, and can only be made after careful study with the aid of radiological methods. Having excluded organic disease such as gastrojejunal or jejunal ulceration, recurrence of duodenal ulcer (which, rather surprisingly, the writers diagnosed in five of their cases), mechanical interference with the loop, gall-stones, etc., there remain those in which no abnormality is found other than subacidity or rapid emptying, and these we may class with the writers as cases of 'indigestion due to gastro-enterostomy'. It is probable, in the opinion of the reviewer, that in the majority of such cases there were no real grounds for the original operation.

Treatment.—In every case the treatment is naturally directed to remedying whatever condition has been found to be abnormal. Patients in whom the passage of material appears to be too rapid are given a solid diet, no liquid being drunk at meal times, but a good quantity taken about an hour before food. This leads to a slower action of the stoma. Very simple food must be taken, and the intervals at which it is prescribed will depend upon the *x*-ray findings, noting whether discomfort comes on when the stomach is full or empty, and whether position affects it. The amount of fat which a patient after gastro-enterostomy can bear is usually less than normal. There is no one diet which is suitable, but the results of the investigation, followed by a fortnight's experiment with different foods, will generally allow a definite régime to be arrived at.

Regular **Rests** and **Exercise** are prescribed. **Hydrochloric Acid**, with or without pepsin, sometimes does much good. **Iron** and **Arsenic** are given for anæmia ; **Massage** and **Paraffin** for constipation. When there is delay beyond the stoma, the first consideration is to decide whether there is evidence of ulceration. If not, **Gastric Lavage**, with massage to the distal part of the stomach, guided by the *x*-ray picture, gives great relief and may get rid of all the symptoms. The treatment is controlled by further *x*-ray examinations. Dilated stomachs in which the stoma is not working are treated by lavage, and may regain their normal size, and empty through the pylorus in a natural time. Lavage is useful also when bile is regurgitated into the stomach. The irritative diarrhœa is often greatly benefited by washing out the colon under low pressure, using **Saline Solution**, with the changes of position and deep breathing which carry the fluid round to the cæcum. Other symptoms are treated as they arise.

Gastrojejunal and jejunal ulcers are best dealt with by operation, and so is persistent regurgitation of bile.

If there is no evidence of organic lesion, if the condition for which the operation was performed has remained quiescent for two years, if the duodenal passage is patent, and if medical treatment has failed to relieve, the anastomosis should be undone.

Spriggs and Marxer are of opinion that the outlook of patients who are ill after gastro-enterostomy is by no means so depressing as is sometimes supposed. It is wrong to assume that little more can be done for them. With medical treatment more than a half of these patients completely recovered or attained great improvement in their health. Of those who do not improve with medical treatment, there is a prospect in many of being restored to complete health by further operation, assuming that every possible step has been taken beforehand to find out what the disturbance is, in function or structure, of the parts concerned. In selected cases the results of a second operation are not merely good, they are brilliant.

Reference.—[1] *Lancet*, 1922, i, 725.

## GASTROPTOSIS.

*Robert Hutchison, M.D., F.R.C.P.*

Attention may be drawn to a paper on this subject by Conran,[1] not because it contains anything really new, but because it is based on a series of 150 cases very carefully studied. Only severe cases were selected, i.e., those in which the gastric shadow reached to a point approximately 10 cm. below a line joining the summits of the iliac crests. In 100 of the cases there was no evidence of any other lesion except the gastroptosis to which the symptoms could be attributed. Constipation was almost universal in these cases; diminution of gastric tone was the rule; and although more than half showed superacidity of the gastric juice, yet the percentage of cases in which there is deficiency of acid is greater than is the case with normally placed stomachs. Delay in the passage of the gastric contents was frequent, and sometimes extreme. As might have been expected, and in spite of the assertions of some writers, no evidence was found that visceroptosis is specially apt to be associated with gastric or duodenal ulceration.

The following are the general conclusions arrived at by the author as the result of his study:—

1. Severe gastroptosis is frequently met with in persons of both sexes who complain of digestive symptoms.
2. In these cases it was several times more common in women than in men; but this predominance had little or no relation to childbirth, as the condition was found almost as frequently in childless women as in mothers.
3. A low position of the stomach is commonly associated with a tall spare build, especially in the case of men.
4. Severe gastroptosis may be unaccompanied by any symptoms which could reasonably be attributed to it.
5. Gastroptosis is only one manifestation of a general condition referred to as the *habitus asthenicus* (Stiller) and *habitus ptoticus* (Walton) by various authors. Both terms are open to objection on etymological grounds. The first is a hybrid of both Greek and Latin origin. The second, also a hybrid, does not indicate the tendency to a general loss of tone which would seem to be the most important pathogenic factor in operation. I would suggest as more descriptive and etymologically correct the term 'hypotonic diathesis'. This I would define as a particular condition or habit of body predisposing to

a loss of tone in the musculature of the alimentary canal, and commonly associated with a low position of the abdominal viscera.

In the production of the derangements of function caused by the diathesis, dropping of the stomach plays a comparatively unimportant rôle, as is proved by the complete and often permanent restoration of gastroptotic patients to health, without alteration of the position of the stomach in the erect position as shown by *x*-ray examination.

6. That the hypotonic diathesis may be congenital is indicated by the discovery of severe gastroptosis in young children.

7. Such children may reach adult life, and even old age, without suffering any inconvenience, provided that they lead an equable existence and are subjected to no great strain by severe illness, overwork, shock, or worry, a rapid succession or a large number of confinements, or other means.

8. In the event of the occurrence of such a strain, an individual with the hypotonic diathesis has a tendency, greater than in the case of a normal individual, to develop a certain train of symptoms.

9. The fact that women are liable to the strain of menstruation in addition to those usually bringing on the group of symptoms in men may explain the greater frequency of the syndrome in the former sex.

10. When a person with this diathesis is subjected to such a strain a vicious circle is set up which, if not broken, seriously undermines his health and resisting powers, and renders him especially susceptible to infection by pathogenic organisms, such as the tubercle bacillus, the organisms causing pyorrhœa, and others. A general lack of tone in the musculature of the alimentary canal manifests itself, together with an alteration in the gastric (and probably intestinal) secretions. There is a tendency to stasis in the stomach, ileum, appendix, and large intestine; and, once started, this delay in the passage of the contents is assisted by an altered configuration of one or more of these viscera. The increasing stasis frequently results in ill health, attributed to absorption of toxins, as shown by anæmia with a sallow complexion, loss of weight, a fall in the blood-pressure, and symptoms such as languor, anorexia, headache, depression, insomnia, and susceptibility to cold.

The malnutrition of the tissues which results, aggravated by distaste for food and alterations in the digestive secretions, leads to a further weakening of the gastro-intestinal musculature, and still greater stasis of the contents.

The symptoms vary greatly, and are not always in accordance with the physical signs discovered. Generally speaking, they roughly correspond with the section of the alimentary canal in which stasis predominates. Thus intestinal delay is associated with constipation, sometimes alternating with attacks of diarrhœa and accompanied by the passage of mucus, and with irregular dull discomfort or pain, mostly in one or other of the iliac fossæ or in the upper abdomen; there may also be symptoms suggesting toxæmia. With gastric delay there may be eructations of gas and sour liquid, nausea, and possibly vomiting, often with epigastric or umbilical pain and with tenderness at a point in the middle line above the navel. In the case of the stomach, symptoms may, of course, be modified according to the composition of the gastric juice. It must be recognized, however, that stasis may be present in either situation without causing subjective symptoms. Some evidence of intestinal stasis, either an *x*-ray finding or a history of constipation, was obtainable in 91 of 100 uncomplicated cases; and, of the remaining 9 patients, 7 complained of no digestive symptoms, but were examined radiographically in the hope of discovering a cause for headache, high blood-pressure, or some other condition not necessarily connected with the digestive organs.

An adequate dietary, sufficient (but not excessive) exercise, and careful attention to the bowels during childhood and adolescence, are the most important points in prophylaxis. In any case of obstinate constipation or indigestion, *x*-ray examination after a barium meal should be made, if possible. By this means the diathesis may be recognized before the vicious circle, described above, is fully set up, and the symptoms be relieved with comparative ease before the general health is impaired.

When once the condition has reached the stage when the various derangements of function react upon each other with progressively evil effects, a course of medical treatment, extending over several months, should be carried out. The constipation is relieved by means of a **Lacto-vegetarian Diet, Paraffin,** and **Abdominal Massage,** with, perhaps, **Electrical Treatment,** and, if very severe, **Intestinal Lavage.** Nutrition is improved by **Rest,** diet, and absence of worry, **Bromides** being given if there is great irritability or insomnia. Hæmatinics are given if the anæmia is severe, antacids if there is gastric hyperacidity, and hydrochloric acid and pepsin if there is poverty of the gastric juice.

In cases of prolonged gastric delay, daily lavage of the stomach will assist that organ to recover its tone. In order to obviate the effect of dropping of the viscera in assisting in the production of stasis, the patient rests on an inclined plane with the feet raised.

If such a régime is possible, the prognosis is good as regards the relief of symptoms and, provided the after-treatment advised is also carefully carried out, as regards the probability of a relapse. The tissues may be subjected again to some severe stress, but the musculature of the alimentary canal will now be in a more resistant condition ; and suitable treatment, based on recognition of the diathesis, can be instituted without delay, so that the attack will either be prevented altogether, or aborted at an early stage.

REFERENCE.—[1] *Quart. Jour. Med.* 1922, Jan., 144.

## GERMAN MEASLES. (*See* RUBELLA.)

## GLANDULAR FEVER.

*J. D. Rolleston, M.D.*

P. F. Morse[1] remarks that this disease, which until ten or twelve years ago was fairly well known (*vide* MEDICAL ANNUAL, 1914, p. 259), has lately become so infrequent as often to escape recognition. The incubation period is from five to ten days. The onset is sudden, with sore throat and stiffness in the neck, and often pain in the upper part of the abdomen or left hypochondrium. Nausea and vomiting are common. The temperature, which is usually normal in the morning and not above 102° in the afternoon, usually becomes settled within a week. The cervical glands are chiefly affected, but the supraclavicular, infraclavicular, axillary, and inguinal glands are almost always palpable. The spleen is enlarged and tender in about 60 per cent. A rise in the white-cell count to 17,000 to 20,000 is the rule, and is entirely due to increase of the mononuclears. The average lymphocyte percentage varies from 75 to 85. Several weeks may elapse before the blood-count returns to the normal. Glandular fever is easily distinguished from tuberculosis, mumps, and acute cervical adenitis by careful physical examination and a blood-count ; and from acute lymphatic leukæmia by its milder course, absence of hæmorrhages, and the appearance of the blood-smear, which shows an absence of immature, atypical, and degenerating forms of leucocytes, and the presence of large numbers of the bi-lobed or Riedel form of cells. The prognosis is favourable, only four fatal cases having been recorded.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1921, ii, 1403.

## GLAUCOMA.

*Lieut.-Col. A. E. J. Lister, I.M.S.*

N. Blatt[1] thinks he is the first to call attention to the fact that the onset of *hemeralopia* (night blindness) affords an important indication as to the prognosis in glaucoma. If the newer type of adaptometer be used, it will be found to be present in some cases even at the commencement of the disease. If hemeralopia is proved to be present, even though the visual acuity be at the time good, it indicates that the malignancy of the case, as regards tendency to recovery, can be improved neither by operation nor by conservative measures. If we accustom ourselves to pay attention to hemeralopia in glaucoma, we have a valuable guide, which will lead us to adopt energetic treatment in such cases, operative if possible. We should, however, warn our patient that there is no certain remedy for stopping the progress of the disease in such cases. [If Blatt's findings are fully confirmed, their value is obvious. It is always important to be able to give a correct prognosis, and, as it may mean giving up a successful career, it is particularly so in glaucoma.—A. E. J. L.]

H. Smith[2] has not met with as large a proportion of sinister results after **Trephining** as some statistics would lead us to expect. He thinks sufficient stress has not been laid on the point that the subconjunctival tissue should always be reflected forward with the conjunctiva, so as to give us a sufficient covering for the trephine opening. He prefers the trephine of Gradle to that of Elliott or any other make. Smith thinks that an **Iridectomy**, properly done, constitutes a drain for a limited time, which, if long enough, admits of the re-establishment of the physiological equilibrium, and that trephining results in a similar drain of longer duration, but that neither are permanent. Smith gained the impression, in a tour to Canada and the United States, that iridectomy properly done gives better results than trephining, apart from its not being liable to late infection.

M. L. Hepburn,[3] as the result of his experience in 140 trephine operations for glaucoma, has formed the opinion that the operation of trephining, performed with every consideration for the conjunctival flap, is the ideal one for chronic glaucoma, especially for the type occasionally met with in young adults ; and the earlier the trephine operation is undertaken, the better.

References.—[1]*Wien. klin. Woch.* 1921, Aug., 403 ; [2]*Practitioner*, 1922, Feb., 131 ; [3]*Brit. Jour. Ophthalmol.* 1922, March 9, 97.

## GOITRE. (*See* Thyroid Surgery.)

## GONORRHŒA.

*Col. L. W. Harrison, D.S.O.*

Diagnosis.—T. E. Osmond[1] has tested 1000 sera for complement-fixation with gonococcal antigen, and obtained 86·5 per cent of positives in the active stages, some of them apparently within the first week. There were many doubtful results which, in the author's opinion, call for repeated clinical and bacteriological examinations before gonorrhœa can be excluded. He found persistence of the reaction for twelve months or more after apparent cure, a result which is contrary to the findings of other workers. Altogether the results show that the complement-fixation test, if carefully carried out, is a valuable aid to diagnosis, and important in determining the question of cure.

Treatment.—A. R. Fraser[2] reviews critically a number of compounds which have been advocated for irrigation in gonorrhœa of males. Judged by the factor suggested by Schwartz and Davis—dilution which kills the gonococcus divided by dilution which can be applied safely to the urethral mucosa—**Potassium Permanganate** is very poor ; but Fraser holds, with most other authorities, that potassium permanganate is one of the most useful remedies at our disposal. He quotes the following remark by Moynihan, which is pertinent to this subject: "It is, I think, very doubtful whether the 'antiseptic' action produced by the addition of a particular chemical substance to a wound is due to those properties which it possesses as a bactericide. It probably possesses other properties also which are not strictly related to its germicidal power." The author's judgement on a number of preparations is briefly as follows:—

**Organic Silver Compounds.**—Useful when the gonococcus is on the surface, but contra-indicated when the disease is established, as they coagulate exudate and impede drainage.

**Flavine Compounds.**—In spite of penetrating power, apt to damage the mucosa and leave the patient with a low form of urethritis which is very difficult to treat.

**Picric Acid.**—Not so good as zinc permanganate in the later stages, for which it has been advocated.

**Mercurochrome 220.**—The opinion of Young, White, and Schwartz, its sponsors, is quoted to the effect that it is a valuable addition, but "no more a panacea for urinary infections than is any other disinfecting agent".

**Dakin's Fluid.**—Tried in the form of Milton, but number of cases too small to warrant conclusions.

**Potassium Permanganate** with 0·5 per cent sodium carbonate the most successful. Should not be stronger than 1–12,000 to 1–8000.

**Zinc Permanganate.**—Useful in the later stages in strengths of 1–10,000 to 1–6000.

**Mercury Oxycyanide.**—Without an equal in cases infected with secondary organisms. Strength 1–8000 to 1–4000.

**Silver Nitrate.**—Useful for a sodden and boggy mucosa in the later stages. Strength 1–20,000 to 1–10,000.

The last four have been found the most useful by the author. [While generally agreeing with this judgement, the reviewer would suggest that **Acriflavine** is valuable as a change from potassium permanganate and mercury oxycyanide; but, as in the case of other disinfectants, a change should be made at fairly frequent intervals. **Milton** has not proved useful in the reviewer's hands. Even in a strength of 1–320 it irritates the male urethra. It is valuable, however, in gonorrhœa of females, where it can be used in 1 per cent solution.—L. W. H.]

P. M. Rivaz and F. G. Hitch[3] publish a valuable review of their experience of treating 1000 cases of gonorrhœa on orthodox lines. They rightly point out that it is easy to become optimistic over the results of a given line of treatment when the standard of cure is low; but when the rigid tests set by the Medical Research Council,[4] by Clarkson,[5] and by others are applied, these show that present-day methods leave much to be desired. They comment on the number of relapses they saw even after the patient had passed these more rigid tests, though it is always difficult to distinguish between fresh infection and relapse. In one series of 52 relapse cases the cause was attributed to prostatitis or vesiculitis in 9; but apparently 5 more had epididymitis and 2 arthritis, so that probably prostate and vesicles were affected in 16 of their relapse cases, showing the importance of these adnexa. In 13 further cases of this series there were persisting infected follicles or infiltrates, while in 23 nothing beyond a secondary infection with diphtheroid organisms or staphylococci could be found to account for the persisting discharge. In 108 relapses from other treatment centres, posterior infection, epididymitis, arthritis, and iritis accounted for 49 cases, and follicles and infiltrates for 11. In the relapse cases, and those classed as urethritis, a feature was the number of cases showing no gross pathological signs, an experience which probably coincides with that of most other workers. Apparently in such cases the mucous membrane remains chronically inflamed, and weeps, like the skin in chronic eczema. [The reviewer has treated a number of such cases with ointments, chiefly containing about 4 per cent **Ichthyol,** with some success. The ointment is used as the lubricant of a metal sound and lightly massaged into the mucous membrane.—L. W. H.] The authors consider **Vaccines** valuable in routine treatment.

M. Huhner[6] retains his faith, expressed over ten years ago, in **Protargol.** The strength is increased gradually from 0·25 to 2·0 per cent. He now recommends that the preparation should be dissolved in 0·85 per cent saline, as this prevents irritation from the injection.

*Stricture following Abortive Treatment.*—Fuchs[7] relates two cases of severe stricture, one nine years, the other four years, after a successful abortive treatment of gonorrhœa with 4 per cent **Albargin.** Fuchs himself uses 2 per cent albargin, and not only warns against higher strengths but recommends sounding of the urethra some months later.

*Injections into the Vas Deferens.*—W. T. Belfield[8] relates that in his experience of 83 cases of vesicular disease, injection into the vas has been attended by remarkable success, and in no case by epididymitis. He thus supports Cumming and Glen,[9] who state on an experience of 55 cases that " vas puncture offers an effectual method for eradication of foci of infection in the seminal vesicles "; also Wolbarst,[10] who describes it as the ideal form of treatment. Belfield recommends the open operation, and states that it can be done easily in the consulting room.

*Epididymitis.*—G. Weill[11] reports well on the subcutaneous **Injection of Hydrocele Fluid** in epididymitis, the temperature and pain subsiding rapidly. Before re-injection the fluid is heated to 45° C. to destroy any gonococci. The author recommends a large dose, his best results being obtained with 10 c.c. The injection is repeated in a few days if the hydrocele forms again. He recalls that Marinesco[12] obtained good results in 2 cases from the same practice. The treatment is analogous to that advocated by Dufour and Debray[13] for the treatment of gonococcal arthritis by injecting the arthritic fluid subcutaneously. E. G. Ballenger and O. F. Elder[14] also report good results from the intramuscular injection of fluid aspirated from joints in arthritis. The dose varied from 15 to 50 c.c., and was repeated every two to seven days for as long as any fluid could be aspirated from the joints.

*Prostatitis.*—W. Arnold[15] reports well on the effects of intravenous injection of **Gonococcal Vaccine** (**Arthigon**), and of intramuscular injections of a **Turpentine-Quinine** mixture. His cases were in three series, each tested for cure by the same stringent examinations. (1) Treated twice daily for seven to twelve days with an intravenous injection of arthigon, generally 0·2 c.c. At the end of this time 15 out of 22 cases were free from gonococci, while 21 showed rapid improvement of symptoms. (2) Injected intravenously every two to five days with gradually increasing doses of arthigon, the total amount given in about 6 injections averaging 4 to 6 c.c. Of 22 cases, 16 were free from gonococci at the end of the course. Between the results of the two methods of arthigon administration the author sees little difference. (3) Injections intramuscularly (two finger-breadths below the iliac crest in the posterior axillary line) of the mixture of refined turpentine and quinine recommended by Karo.[16] The dose was increased every third day from 0·5 c.c. to 2·5 or 3·0 c.c., a total of 6 or 7 injections being given. In 19 out of 22 cases gonococci had disappeared by the end of the course, and the author concludes that turpentine injections give even better results than intravenous vaccine. Moreover, in many cases the only local treatment required is irrigation.

*Gonococcal Arthritis.*—Martin Pulido[17] has had such excellent results in gonococcal arthritis from intravenous injections of **Mercury Perchloride 1–1000**, following Baccelli's method of treating polyarticular rheumatism, that he is amazed that it is not adopted as a routine measure.

Dufour, Thiers, and Alexewsky[18] record more cases illustrating the good effect of **Aspiration** followed by subcutaneous injection of 10 to 20 c.c. of the aspirated fluid. In six cases a cure resulted in four to thirty days. Seven cases reported by others have been equally favourable.

C. W. Collings[19] reports that he treated 26 out of 517 cases of gonococcal arthritis with heavy **Casts of Plaster of Paris.** In no case did ankylosis result. The cast was removed at the end of two weeks, the joint rubbed with alcohol, passively moved, and the cast again applied. Then the joint was subjected to radiant heat and thirty minutes' massage every day. The patient usually walked after ten days, One-third of the cases were discharged in 18 to 36 days, one-third in 36 to 60 days, and one-third in 60 to 81 days.

A. O. Ross[20] reviews the various methods of treating gonococcal arthritis, and, in addition to such measures as prostato-vesicular massage, with irrigation, and local treatment of joints, strongly recommends injections of **Electrargol.** The injection is preceded by **Aspirin** gr. xv, which reduces the later reaction. The first dose is 5 c.c. intramuscularly ; the second 5 c.c. intravenously on the following day ; the third 10 c.c. intravenously on the third day. Thereafter the injection is repeated every two days. In addition, gonococcal **Vaccine** is given on the sixth, ninth, thirteenth, and seventeenth days in doses of 50, 100, 200, and 300 million. The reviewer can support the author's claim for the good effect of electrargol. The experience at St. Thomas's Hospital appears to indicate that it acts more rapidly than antityphoid vaccine.

R. Bertoloty[21] has treated two series of cases of gonorrhœa in all stages with **Diathermy**, and reports satisfactory results in all cases. Generally the current was about 200 ma., and sittings lasted twenty-five to thirty minutes. The treatment was particularly useful in arthritis, epididymitis, and prostatitis, curing many cases which had resisted other forms of treatment. It is useful also as a preliminary to the dilatation of strictures, rendering these much more permeable.

*Vulvovaginitis of Girls : a Common Cause of Relapse.*—Edith Valentin[22] holds that in cases of vulvovaginitis relapse is frequently caused by gonococci which have lurked in the rectum. Out of 94 children with recent or chronic gonorrhœa, no less than 92 were suffering also from gonococcal proctitis ; in 61 relapse cases, gonococci were found in the rectum every time. The treatment of vulvovaginitis should on this account include the rectum.

*Gonorrhœa in Women.*—V. C. Pederson[23] gives much useful general advice on routine treatment. He regards as highly important an accurate diagnosis, since other infections simulate gonorrhœa. Two slides each are taken from urethra, vulva, vagina, and cervix. At the same time he deprecates blind adherence to microscopical examination to the exclusion of clinical. For treatment he relies on older preparations, and eschews irritants and caustics. Douching should be carried out only in the lying position, using a long nozzle and a solution of 1–8000 (increased later to 1–4000) **Potassium Permanganate.** After the douche the patient should remain lying for fifteen to twenty minutes to allow the solution to act. For the cervix, topical applications rather than injections are needed, mucus being first removed carefully down to the bare membrane. **Electrotherapy** is valuable as an adjuvant : sometimes diathermy and sometimes the sinusoidal current, according to what is found to suit the patient. High-frequency with a tube giving a bluish-white fluorescence is valuable in urethritis, vulvitis, and vaginitis. In chronic uterine lesions, drainage is secured by opening the cervix with the negative galvanic pole and a current of 5 to 10 ma. for a few minutes until the cervix relaxes around the instrument, when a larger one is used until the cervix will admit an instrument 1¼ in. in diameter. Thereafter **Ionization** with zinc chloride (positive pole), iodine, chlorine, and salicylates (negative pole) is valuable.

**Intramine** is advocated for the treatment of chronic cervicitis and endometritis by G. W. Rundle.[24] A pessary containing 1 per cent intramine in a stearine base is inserted every night for a month. Care must be taken to prevent the remedy touching the vulva, as it causes sulphur dermatitis.

Test of Cure.—H. Nevermann,[25] following the work of E. F. Müller, who tested the provocative effect of intracutaneous injection of **Aolan** (Medical Annual, 1921, p. 230), has tried a number of other preparations in women. These included caseosan, horse serum, arthigon, and gonargin. He found that aolan gave 25 per cent of successes in previously negative cases; arthigon, 18 per cent; horse serum and gonargin, nil. He concludes that aolan is the best preparation for the purpose, and that it does not act by virtue of its casein.

References.—[1]*Lancet*, 1922, i, 1143; [2]*S. African Med. Record*, 1922, April 8, 131; [3]*Jour. R. N. Med. Service*, 1922, April, 117; [4]*Med. Research Council, Special Rep.* No. 19; [5]*Brit. Med. Jour.* 1921, ii; [6]*Med. Record*, 1921, Sept. 10, 459; [7]*Münch. med. Woch.* 1922, April 28, 622; [8]*Jour. Amer. Med. Assoc.* 1922, April 29, 1290; [9]*Jour. Urol.* 1921, Jan. (ref. Belfield); [10]*Amer. Med.* 1921, Nov. (ref. Belfield); [11]*Presse méd.* 1921, July 9, 544; [12]*Presse méd.* 1920, May 19; [13]*Bull. Soc. méd. des Hôp.* 1920, No. 35; [14]*Surg. Gynecol. and Obst.* 1921, Nov., 574; [15]*Münch. med. Woch.* 1922, April 28, 621; [16]*Deut. med. Woch.* 1919, No. 10; [17]*Siglo méd.* Madrid, 1921, Oct. 1 (ref. *Jour. Amer. Med. Assoc.* 1922, Feb. 18, 550); [18]*Bull. Soc. Méd. Hôp. de Paris* (ref. *Jour. Amer. Med. Assoc.*, 1922, Feb. 11); [19]*Internat. Jour. of Surg.* 1921, Oct. (ref. *Therap. Gazette*, 1922, Feb., 106; [20]*Edin. Med. Jour.* 1922, May, 185; [21]*Med. Ibera*, 1921, xiv, 4 (ref. *Surg. Gynecol. and Obst.* 1921, Aug., 155); [22]*Deut. med. Woch.* 1921, 628; [23]*Med. Record*, 1922, Feb. 25, 314; [24]*Lancet*, 1921, ii, 802; [25]*Münch. med. Woch.* 1922, Jan. 27, 113.

## GOUT.

*Charles E. Sundell, M.D., F.R.C.S.*

*X-ray Diagnosis.*—Jansen[1] describes bone-tophi in chronic cases appearing as clear areas with darker margins in the metacarpal bones and lower end of the radius.

Munro[2] has investigated the *blood-picture* in twenty-seven cases of gout. He finds that though the number of red cells may be above or below normal, the hæmoglobin index is almost always low. In two cases he counted 7,000,000 red cells per c.mm. The number of leucocytes varies, but is usually above normal. He has also investigated gouty tophi, and finds that they consist of milky fluid which is sometimes sanguineous. In only 50 per cent do they contain crystals; sometimes no urates are present, and the solid matter may consist of calcium phosphate. He suggests that tophi are masses of necrosed tissue and leucocytic débris analogous to cold abscesses. Chauffard[3] notes that cholesterin is always present in tophi, and gives them their yellowish colour.

Chauffard[3] has studied the *chemistry of the blood and body fluids* in twenty-seven cases of gout. He finds that the uric acid content of blood serum in the gouty rises from the normal 4 or 5 cgrm. per kilo to 9 or 10 cgrm. The red corpuscles show a corresponding increase in their uric acid content (20 to 36 cgrm. per kilo). Ascitic and pleural fluids have the same uric acid content as blood serum, but the cerebrospinal fluid contains merely a trace. There is a rise in the cholesterin and bilirubin content of the blood in gout, suggesting that the liver exerts an influence in the disease. He has studied the uricolytic function of the liver by comparative analyses of blood from the portal and hepatic veins of dogs fed on purin diet, and finds that the liver has the power of destroying exogenous uric acid. In view of Llewellyn's views it is interesting to see that Chauffard is also struck by the similarity existing between a paroxysm of gout and a case of anaphylactic shock. He thinks that it is possible that the paroxysm is associated with a change in the colloidal combination of uric acid in the body.

Llewellyn[4] advances a novel theory of gout. He regards the gouty diathesis as one of hypersensibility to the protein moiety of certain nucleoproteins ; he calls attention to the very close connection which exists between gout and spasmodic asthma. He points out that the sensitization upon which anaphylaxis depends is a cellular and not a humoral phenomenon, and he attributes the apparent influence of shock or infection in precipitating an attack of gout to an alteration in the protein molecule or in the chemistry of the cell. Uricæmia and uratic deposits, in his view, are merely symptomatic; that exogenous purins are not the cause of gout he considers is evident, from the fact that strawberries, which contain no purins, are a potent cause of gouty paroxysms. The influence of beer and wines is explained by virtue of the protein of the yeast cells which they all contain, or of the protein which is added in the process of 'fining' wine.

Treatment.—In the treatment of gout and glycosuria Lunn[5] advocates very strongly Guelpa's method of **Starvation** and **Purgation.** He bases his support upon the happy results of this line of treatment upon his own person. He gives details of the routine which he has himself found very helpful, but insists upon the necessity for medical supervision during the fasting periods in view of the risk of acidosis.

References.—[1]*Acta Medica Scandinavica,* lvi, 1 ; [2]*Lancet,* 1922, i, 938 ; [3]*Presse méd.* 1922, 253 ; [4]*Lancet,* 1922, i, 475 ; [5]*Ibid,* 1921, ii, 1157.

## GRANULOMA VENEREUM.

*E. Graham Little, M.D., F.R.C.P.*

Randall Small and Belk[1] contribute an important and beautifully illustrated monograph on this disease as observed in the Philadelphia General Hospital, where some fifteen cases are admitted yearly. The earliest lesion is usually a small non-inflammatory papule which becomes purulent and is indolent in healing. Flesh-red exuberant masses of granulation tissue form, with deep pus pockets. Older lesions may become more prominent, simulating condyloma acuminatum. The most frequent site is the groin, from which it spreads peripherally. Little pain or discomfort and no constitutional symptoms such as fever are present, but a secondary anæmia is common. Wassermann tests are negative, and when present indicate a double infection. All the authors' cases, with one exception, were in negroes. The diagnosis is confirmed by finding the characteristic encapsulated bacillus of Donovan, and also by the result of giving **Antimony,** which acts as a specific. The authors succeeded in making cultures in three cases of an organism resembling Donovan's encapsulated bacillus, which proved to be encapsulated bacilli of the *Bacillus mucosus capsulatus* group. They grow freely on all culture media, and are favoured by an acid reaction. The organism is a Gram-negative, non-motile, non-sporulent encapsulated bacillus, which shows metachromatic granules as well as capsules with Romanowsky staining. It does not liquefy gelatin or coagulate serum. Freshly isolated cultures hæmolyse blood. Milk is coagulated and acidified. Indol is not produced. The organism ferments dextrose, lævulose, lactose, galactose, saccharose, maltose, mannite, arabinose, salicin, inulin, and dextrin. It does not ferment dulcite or rice starch.

Intraperitoneal inoculations of strains derived from granuloma proved rapidly fatal to mice and guinea-pigs, but cutaneous inoculations in these animals did not produce any growths like granuloma. Treatment consists in giving **Tartar Emetic** by intravenous injection, raised from an initial dose of 0·004 grm. to 0·1 grm. Injections daily, or at least at frequent intervals, governed by clinical improvement, are recommended.

This condition is sufficiently rare in whites to justify the report of a case which Parounagian and Goodman[2] contribute. The patient was a native American, born in New York City, which he had never quitted. When seen he had ulcerating granuloma of the upper lip, the side of the neck, the groin, the scrotal-femoral clefts, the anus, and gluteal-femoral clefts. There was no glandular enlargement connected with these distributions, notwithstanding that the surface was very foul. Extracellular and intracellular encapsulated short bacilli, resembling Donovan's organism, were demonstrated in smears. The patient had a positive Wassermann, and the authors rely for differentiating the granuloma inguinale lesions from those of tertiary syphilis on the failure of response of the ulcerating masses to salvarsan ; but the patient did not give the opportunity of testing response to tartar emetic injections.

Lynch[3] reports from South Carolina three cases, one white man, one negro, and one negress. Both men had had syphilis, but at the time of examination were 'serologically cured', and antisyphilitic measures produced no effect on the groin lesions. Donovan bodies were found in scrapings from all three cases. **Tartar Emetic** therapy was used.

Winfield and Hoppe[4] add two new cases, one in a white and one in a negro, natives of New York. The first was in a woman, age 18, who contracted the disease six weeks after intercourse with a South American sailor. A warty mass developed which spread all over the vulva and into the vagina. Wassermann tests proved negative, and no gonococci were found. No Donovan bacilli were demonstrable. The patient improved rapidly with **Tartar Emetic**, internal medication, and local antiseptics. The second case was a negro born in the United States and never absent from them. He came for treatment of a granulomatous swelling over the pubes and groin and root of penis. The first diagnosis was syphilis, on a weak positive Wassermann. Specific treatment was given with only partial success, but persistent failure to cure suggested the possibility of granuloma venereum. No quite typical encapsulated bacilli were found. The patient did not give an opportunity for adequate antimony administration.

REFERENCES.—[1]*Surg. Gynecol. and Obst.* 1922, June, 717 ; [2]*Arch. of Dermatol. and Syph.* 1922, May, 597 ; [3]*Jour. Amer. Med. Assoc.* 1921, Sept. 17, 925 ; [4]*Med. Record,* 1922, Jan. 14, 57.

## HÆMORRHAGE FOLLOWING TOOTH EXTRACTION.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

In the *Revue de Stomatologie* (January, 1922) Dr. Thésée gives an account of a boy, age 10 years, who succumbed to hæmorrhage following the removal by the boy himself of a right lower second deciduous molar. The roots of the tooth were completely absorbed, and the child pulled the tooth away with his fingers. The attention of the parents was drawn to the bleeding on the third day ; pressure was applied to the bleeding area, and injections of hæmostyl were given. The hæmorrhage continued, with remissions. He was admitted to hospital and gelatin serum was injected, but his life could not be saved.

Hæmorrhage after the extraction of teeth may be serious, and since the patient may not take alarm until several hours have elapsed, it often becomes the duty of the nearest available doctor to treat the case. Plugging the socket, providing it be accurately applied, will generally suffice, but may not be easy, and many styptics have been recommended as an adjuvant. Some of these, for example ferric chloride, give rise to subsequent sloughing, which more than outweighs their hæmostatic action, and are therefore to be condemned ; others, like adrenalin, are so quickly diluted by saliva or blood that they become ineffective. Mr. F. St. J. Steadman, in an interesting paper read before the Section of Odontology of the Royal Society of Medicine, and published in the *British Dental Journal* for April 1, advocates the use of **Oil of Turpentine,** and states that over an experience of twelve years he has not known it to fail. The method of application is simple. The gauze is soaked in the drug and the socket packed ; if necessary it is kept in place by stitching or by applying a pad over the gum and bandaging the jaws.[1]

REFERENCE.—[1]*Lancet*, 1922, i, 1006.

## HÆMORRHOIDS, INTERNAL.

*J. P. Lockhart-Mummery, F.R.C.S.*

A great deal has been written on the treatment of internal hæmorrhoids by **Injections** during the last year, and one or two writers have ventured to suggest that this should replace operative treatment altogether. This is, of course, a gross over-statement of the case. The method of treating internal piles by injection was discussed by the writer in the MEDICAL ANNUAL, 1922, p. 201, and a description given of the method. As it was there stated, this is an excellent way of treating piles in the early stages and before bad prolapse has occurred. It is also very suitable as a palliative measure where people cannot afford the time to undergo an operation, and in elderly people or those suffering from illnesses in whom an operation is contra-indicated. It can never, however, be a substitute for operative treatment, and it cannot deal adequately with bad cases of prolapsing piles, and it is not curative in the sense that an operation is. This method has been practised in St. Mark's Hospital for the last forty years, and the writer has used it continually on suitable cases for nearly thirty. It is a very good method in selected cases, provided the operator is thoroughly skilled in the method ; but it is by no means free from complications if carelessly done, and recurrence is the rule rather than the exception. A very good paper appears by Lieut.-Colonel Hooton[1] summarizing the history of this procedure and discussing the results.

Arthur Morley[2] would have us believe that the results from the injection treatment are better than those obtained by operation. This is, of course, an over-statement, and the complications which he mentions as following the treatment would seem to be as numerous as after an operation. The truth of it is that the injection treatment is an admirable palliative means of treating internal piles, but that the only suitable method of curing them is by operation. If the operation for piles is properly carried out, it should not cause any pain, and the complications should be quite negligible, while the recurrence is not more than about one or two per thousand. This is assuming that a proper operation is performed, either by the ligature or the clamp and cautery, by an experienced surgeon.

A paper published by Sir John O'Conor[3] again advocates our old friend the **Whitehead Operation.** No doubt excellent results can be obtained by means of this operation if it is carefully done ; but the general opinion in this country, as expressed at the Newcastle Meeting of the British Medical Association, was absolutely opposed to it, and the long series of cases collected at St. Mark's Hospital prove that even if it is carefully done it is far inferior as regards results to either the **Ligature** or **Clamp and Cautery Operation.** In fact, the bad results which often follow Whitehead's operation have been largely responsible for frightening people from having piles operated upon.

Most of the failures after operating upon piles are due to faulty technique. One of the great troubles is that piles are operated upon all over the world by all kinds of people and by all kinds of methods, and many of the results, as is only natural under these circumstances, are very bad. Given a skilled operator, the results are probably better than in any other operation in surgery, and the best results will generally be obtained where each individual operator uses that method with which he is best acquainted. At St. Mark's Hospital, where thousands of operations for piles have been done by all methods and by several surgeons, we are able to make careful comparisons, and there can be no possible question that the results, both immediate and late, from the ligature and from the clamp and cautery operations are infinitely superior to those obtained by any other method.

References.—[1]*Ind. Med. Gaz.* 1921, Dec., 458; [2]*Practitioner,* 1922, June, 403; [3]*Brit. Med. Jour.* 1922, i, 759.

## HAY FEVER.

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

Mackenzie[1] reports good results from a combination of subcutaneous injection of **Pollen Extracts** with the local application of the extracts by means of a spray to the nasopharyngeal mucosa. He tabulates the results obtained by the combined method, compared with the use of the spray alone or the injections alone, as follows:—

| Result | Injections alone | Spray alone | Spray and Injections |
|---|---|---|---|
| Complete relief .. | 0 | 1 | 3 |
| Almost complete relief .. | 3 | 2 | 9 |
| Considerable relief .. | 4 | 6 | 6 |
| No relief .. .. | 1 | 1 | 2 |
| Total .. | 8 | 10 | 20 |

Chandler Walker[2] emphasizes the importance of bearing in mind which pollens are indigenous to the locality in which the patient lives, and also the better results obtained by injection with pollen extracts specific to each case rather than the ordinary commercial mixtures of various pollens which prevail at different seasons. He concludes that pre-seasonal treatment is greatly to be preferred to during-the-season treatment, though the latter is worth trying when the former has been neglected. He obtains the best results by working up from a very weak dilution to 5 or 6 injections of a dilution of 1–500, or, better still, 2 or 3 injections of 1–100 of the pollen extract. The initial injection should be one dilution weaker than that which gives a positive cutaneous reaction. Chandler Walker also points out that seasonal hay fever can be caused by animal emanations and bacteria in addition to pollen dust.

Flaudin[3] states that desensitization by means of injections of pollen extract has not been found to yield satisfactory results in France, and claims better results from the injection subcutaneously of **the Patient's own Blood-serum.** For the purpose the initial dose is ¼ c.c., which is doubled daily until 2 c.c., are injected on the fourth day. This dose is repeated every two or three days until from six to ten injections have been given. This treatment is based on the so-called cryptotoxic property of the blood in hay fever, which stimulates the formation of specific desensitizing bodies when injected subcutaneously.

References.—[1]*Jour. Amer. Med. Assoc.* 1922, March 18; [2]*Arch. of Internal Med.* 1921, July; [3]*Jour. de Méd. et de Chir. prat.* 1921, June.

**HEART.** (*See* Bradycardia; Digitalis; Endocarditis; Mitral Stenosis; Pericarditis; Quinidine.)

## HEART IN HYPERTHYROIDISM. (*See* THYROID DISEASE.)

## HEART, SURGERY OF.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

From the surgical standpoint, rupture of the heart, gunshot wounds, and methods of heart massage in cases of emergency, are alone of interest.

**Traumatic Rupture of the Heart** is rare (*see* MEDICAL ANNUAL, 1919, p. 186). The writer saw one case in Mercer's Hospital, Dublin, of a young actor who was killed instantly in the street by a motor car. The heart was practically torn into two halves from indirect violence. There was no external wound.

**Gunshot Wounds of the Heart.**—There has been a flood of literature on this subject, as a result of the war. Braizew[1] deals with the question of removal of foreign bodies from the heart. The indications for operation are to be considered with caution. According to this writer, access to the heart can be obtained by resecting the fifth costal cartilage. The costal cartilage above and below may be separated at the sternum and drawn back with a retractor. In the case reported on which this paper is based, the heart stopped whenever traction was applied to it. Silk is recommended to suture the wound. Experiments on dogs showed absorption of No. 4 catgut after five days, followed by hæmorrhage.

In the case in question, the $x$ rays showed the bullet in the right ventricle. An arched parasternal incision was made, extending along the sixth costal cartilage: the pleura bulged outwards; the mammary artery was tied and the pericardium opened. The myocardium was incised and the projectile extracted; two rows of silk interrupted sutures closed the myocardium. The patient made a good recovery.

The results of removal of foreign bodies from the heart have been satisfactory. Most of the projectiles in the recorded cases were embedded in the myocardium; but Lefort and others have described cases of removal of the foreign bodies from the auricles and ventricles.

**Massage of the Heart.**—Direct massage of the heart, when the abdomen is open and the patient apparently dead, is a matter of great simplicity. The heart should be gradually compressed and abruptly relaxed. This process should be continued at about the rate of thirty compressions per minute, or approximately about half the normal heart-rate. A short interval should be allowed occasionally to allow for spontaneous recovery. If success follows massage, intravenous injection of **Adrenalin** or **Pituitrin** will bring about rapid improvement, the blood-pressure rising and the heart beating more strongly. [*See also* ANÆSTHETICS (METHODS OF RESUSCITATION), and MEDICAL ANNUAL, 1922, p. 26.]

REFERENCE.—[1]*Surg. Gynecol. and Obst.* 1922, Jan., 19 (abstr.).

## HEATSTROKE.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

R. H. Alexander[1] records observations on heatstroke at Basra, in the Persian Gulf, which confirm the generally accepted view that the disease is essentially caused by extreme heat, as 92 per cent of the cases occurred during the hottest time of the afternoon, from 12 noon to 8 p.m., and 33 out of 35 cases when the temperature was distressingly high, with a maximum of about 124°. The place is very malarious, and hyperpyrexia also occurred in cases of malaria and sand-fly fever and in debilitated subjects. During 1921 hot-weather regulations regarding clothes, hours of work, and sale of intoxicants, together with ice, ventilation, electric fans, and bath stations in suitable localities, reduced the cases remarkably, only 6 being seen.

PROGNOSIS.—This was affected favourably by promptitude of treatment, previous good health, and comparative youth, while the mortality rose with each decade of life; but alcohol had the greatest effect on the results, as the mortality was 100 per cent in chronic alcoholics and nil in total abstainers.

TREATMENT.—This consisted of the reduction of the temperature by **Iced Water** and blocks of **Ice**, and, if a fall did not occur within a few minutes, iced-water enemata were very effective, these procedures being stopped when the temperature fell to 103°, and repeated again if it became necessary. In view of the frequent malarial complication, 10 to 15 gr. of **Quinine Bihydrochloride** were given intravenously as a routine measure, and **Digitalis** and **Camphor** used as cardiac stimulants, while delirium and convulsions were controlled by **Chloroform** inhalation, followed by **Morphia** if necessary.

REFERENCE.—[1]*Jour. R.A.M.C.* 1922, May, 358.

## HERNIA.

*E. Wyllys Andrews, M.D., F.A.C.S.*

### INGUINAL HERNIA.

As hernia is one of the most common surgical diseases, it is but natural that the amount of current literature about it should be enormous. In spite of this, real steps in advance are constantly being made, and many new and valuable ideas are published. On the other hand, a great number of operations or steps in operations described as original and new are in fact far from such. In going over this year's literature on hernia, I find over a dozen elaborate descriptions of 'new' operations, any one of which was well known to any student of the subject prior to 1900.

*Etiology.*—Coley and others,[1] in a report on hernia in relation to compensation acts and employers' liability, give some interesting data. They say that most of the law on the subject and the procedure of compensation boards are based on some very old decisions. Science has progressed, and an utterly different view is now taken of the etiology. All the evidence now shows that traumatic hernia is an extreme rarity, if indeed it ever occurs. Authorities on the matter are in practically unanimous agreement that oblique hernia never comes on without the existence of a pre-formed congenital sac, and also a long-standing weakening of the muscles of the abdomen. In the light of the above, a hernia should be compensated for only in very few cases. Unfortunately, most courts take the older view, and much injustice results. Several highly enlightened decisions have been handed down by the bench which might well be precedents, but they are by no means generally followed.

If one faces the fact directly, the following rules should be adopted. No hernia can be considered traumatic and hence subject to compensation except under the following conditions: (1) That the immediate cause of the hernia be a sudden blow or strain of greater severity than the patient is accustomed to receive, and that this be received in the course of employment; (2) That the descent of the hernia immediately follow; (3) That severe pain follow in the hernial region (Coley says that at the Hospital for the Ruptured and Crippled in New York, where 5000 cases a year are seen, he has not seen a single case of recent hernia which was tender, or accompanied by ecchymosis, in 31 years); (4) That these facts be reported at once; (5) That evidence be brought that no hernia existed previously.

Russell[2] is also of the opinion that acquired hernia is a rarity, and presents a new classification, based on the degree of obliteration of the processus vaginalis.

*Recurrence* statistics are always of interest. Schwartz[3] followed 207 cases operated during the last ten years. The typical Bassini technique was carried out in each case. Of the 207 cases, 11 (5·3 per cent) had recurred. There were no recurrences in children. The average age of the recurrences was forty-seven years. Of the 11, 7 had healed normally, 3 had had hæmatoma formation, 1 was frankly infected, and another had considerable serous discharge from the wound; 9 of the recurrences took place in the first year, the other 2 in the second year; 2 cases had severe cough, 1 gave a history of bodily strain, but in the other 8 no etiological factor could be found; 7 of the new hernias were at the inner angle of the scar, 1 was among the cord, and in the remaining 3 no report was made.

These figures correspond with the other follow-up reports. The frequency of recurrence is about the same, and there is agreement as to the facts that those advanced in years are more prone to recurrence, and that it usually appears near the pubic spine. This latter point has frequently been noted, and should warn us that this is the danger point, indicating special care in the insertion of the lowest stitch. It also argues against the procedure of Ferguson, that is, sewing the conjoined tendon over the cord.

Hoguet[1] remarks how little attention is paid to *direct hernia*. The current literature is scanty, and even what there is consists mostly of observations incidental to oblique hernias. Most surgeons seem complacent on the matter, and make no endeavour to improve their technique, in spite of the fact that several recent reviews have shown that our results are far from perfect. Several such articles have been reviewed in these pages in the last few years. Hoguet quotes Coley as saying that he believes that if complete follow-up reports were available, it would be shown that 10 to 15 per cent recurred. In the articles reviewed here the figures were even higher. Hoguet thinks that the reason is that we do not properly appreciate the decided weakness of the floor of the canal in these cases. Most of the recurrences are due to this cause. A hernia into the canal, even though it does not extend any farther, is still a hernia. Weakness or absence of the lower fibres of the conjoined tendon is the only direct etiological factor in this type of hernia. The sac is purely secondary, is generally sessile, and, contrary to the cases of oblique hernia, is truly acquired. What is normally a strong buttress of muscle bundles firmly bound together by fibrous tissue, arching over the internal ring from Poupart's ligament to the pubis, is found to consist only of a few frayed strands of muscle with a minimum of fibres, and attached to the rectus sheath instead of the pubic bone. These fibres are essentially too weak to withstand intra-abdominal pressure, and no operation which utilizes them alone can be adequate. The following recommendations are made: If the conjoined tendon is full and adequate, suture of it alone to the inguinal ligament will suffice to build a floor for the canal. If it is deficient, some other structure is needed to reinforce it. This may be done with the rectus or with the upper fragment of the external oblique aponeurosis. Hoguet followed 142 cases. Of 68 Bassini operations, 5 failed (7·3 per cent); of 35 Halsteads and 39 Andrews operations, but one of each failed (about 2·5 per cent).

[The reviewer believes that one may well go even farther than this. It has been his practice of recent years in all direct hernias to utilize not only the imbricated conjoined tendon, but the rectus as well. This adds very little to the difficulties of the technique, and gives an added safeguard. As Hoguet remarks, the rectus transplant is under considerable tension, and the normal muscular tone tends to pull it loose from its new insertion. For this reason it cannot be expected to adhere very far out on to Poupart's ligament. However, even if it is brought out 2 cm., it reinforces the spot where most recurrences take place. The suture of the upper cut fragment of the external oblique aponeurosis makes a firm guard for the more lateral portion.—E. W. A.]

The *bladder* often appears in the wall of the sac of direct hernias. Baker[5] reports a case where it was accidentally opened. He sutured the hole and attained primary union. This case was one of bladder diverticulum in the hernial sac. Such conditions are not rare. In many of the bladder hernias reported, a pouch had thus been drawn out by the hernia. Its walls were much thinner than those of a normal bladder. Bladder is said to be found in about 1 per cent of all hernias. The danger is not so much in opening it accidentally as in not recognizing that this has been done. Most of the cases in which careful repairs were made have healed rather kindly. On the other hand, those in which a needle had penetrated the bladder, or where a little of the wall had been included in the ligature of the sac, had a mortality of 30 to 40 per cent. Coley says that he has never opened the bladder, because he has carefully observed the warning sign. That is fat. If redundant fat is encountered in the floor of the canal, one can be sure that the bladder is near at hand. Hæmorrhage is another warning sign. This may also account for the fact that he has encountered but 14 cases in his enormous experience. [I have seen considerably more myself, perhaps due to the fact that I used to make it a practice to clean out this region rather carefully. For many years, however, it has been my routine to excise the sac in direct hernia only if it appears to be pedunculated. Sessile dome-shaped sacs have been let alone. Since this has been my practice, I cannot recall having seen the bladder at all, although I have no doubt that it was often present below the plane to which my dissection was carried.—E. W. A.]. Nicoll[6] speaks very aptly of the 'bladder bogey'. He says that very often one will erroneously conclude that what is in reality a thick sac is the bladder wall. Many surgeons point impressively to such structures and remark how nearly catastrophe has occurred. It has been his practice to fill the bladder with boric in all cases where it was under suspicion. It is then easily palpable. Nine times out of ten it is found to be well out of the field.

Polya[7] reports 6 cases of *retrograde strangulation*, and Breitner,[8] Hempel,[9] and Patel and Vergnory[10] each report one. As case-reports of this condition increase in frequency, one is led to wonder if it cannot account for at least some of the mortality of strangulated hernia. Certainly the majority must be overlooked. The cause of the condition remains a mystery. In many cases the mesentery of the gangrenous portion is in the sac, but this is by no means always true; that is what makes it so hard to account for the condition. Traction on the root of the mesentery is often assigned as the reason, or pressure from a tense ligament of Treitz, or some such phenomenon; but none of these can account for the fact that the herniated bowel is exempt. Volvulus of the unherniated bowel segment has been assumed by some, and seems to be the only mechanism to account for all cases.

## FEMORAL HERNIA.

New methods for closing the femoral canal continue to appear. As to the method of approach, the vast majority continue to be done by the inguinal route on account of its simplicity. Piotrowski,[11] Asteriades,[12] and Reschke[13] report extensive experience with this method. There were recurrences in but 3·5 per cent. All three used the method of Kusner, in which deep U stitches are inserted to approximate the inguinal ligament to the posterior wall of the canal. These are to include pectineus muscle, fascia, and Cooper's ligament if possible. Maclennan[14] prefers the bone staple of Jacoe.[11] This is pressed through Poupart's ligament and then driven into the ramus of the pubis.

Richard[15] describes a technique which has decided advantages. He raises the inguinal ligament so as to expose Gimbernat's. The latter is then cut, and thus one can look up into the inguinal canal quite freely. The conjoined tendon is then isolated and pulled down and stitched on to the pubis. The repair thus made should be a strong one. There is one marked drawback. In sectioning Gimbernat's ligament we are destroying one of the strong walls of the femoral ring. Should the new plug fail to hold, the ring is much enlarged.

La Roque.[16] whose operation for inguinal hernia was reviewed here last year, claims that the approach is equally adapted for femoral ones. The inguinal canal is opened, and then, instead of going between the internal oblique and Poupart's ligament to reach the femoral sac, a small incision in the internal oblique is made a few centimetres above its border. The peritoneum is opened here, and the neck of the sac exposed from within. Excision of the sac is then easy, and the great advantage is that closure of the stump can be made with much greater accuracy, and particularly one can be sure that no dimple in the peritoneum is left to act as a wedge for future herniation.

## VENTRAL HERNIA.

Probably no operation calls for such ingenuity as that of closing a large defect in the abdominal wall. No routine can be established, and each case must be a law unto itself. Large ventral and umbilical hernias (and they soon grow large) are very prone to strangulation. Operations in this stage have a very high mortality. Warren[17, 18] had 10 deaths in 28 such cases. For this reason attempts at cure are always in order, even if grave difficulties are encountered. As pointed out by Warren, and also Cignozzi,[19] the one hope of permanent cure is to secure a wide overlapping of the layers of the abdominal wall. Many cases are seen, however, in which this is impossible on account of the extent of the defect or because of the atrophy of the walls. Under such conditions many other alternatives are open. Pedicle flaps made of the aponeurosis of the lateral abdominal walls, or from the fascia over the anterior wall, are recommended by Farr.[20] These can be made of very large size, and have several advantages. There is no weakening at their place of origin. This is especially true of the large pectoral flaps. The nourishment is invariably ample, and the danger of sloughing slight. These structures are stronger than anything left on the anterior abdominal wall. Ramlau-Hansen's[21] suggestion of utilizing the sartorius muscle may also be of service. The future of this sort of surgery will undoubtedly see a freer use of pedicle flaps from regions other than the abdominal wall. Free transplants have very obvious disadvantages. If one considers that in most operations for ventral hernia we deliberately weaken one part of the abdominal wall to reinforce another, the advantages of such procedures is obvious.

It is not only in the closure of the defect that difficulties may be met in ventral hernias. Adhesions within the sac are frequent, and, as the sac is generally multilocular, often give rise to insurmountable obstacles. Cullen[22] reports a case of universal adhesion of the intestines in such a sac. These were so firm that separation was impossible, and the bowels had to be returned to the belly with numerous bits of sac wall attached. These were all trimmed close, but could not be entirely removed.

Watson[23] calls our attention to the danger of procrastination in cases of *congenital umbilical hernia.* These are the so-called amniotic hernias. In a collected series, those operated within twelve hours gave 12 per cent mortality, in contrast to 66 per cent in those operated after forty-eight hours. The only chance of cure lies in an operation before the growth of bacteria in the Wharton's jelly has had time to occur.

# *PLATE XXV.*

## DIAPHRAGMATIC HERNIA

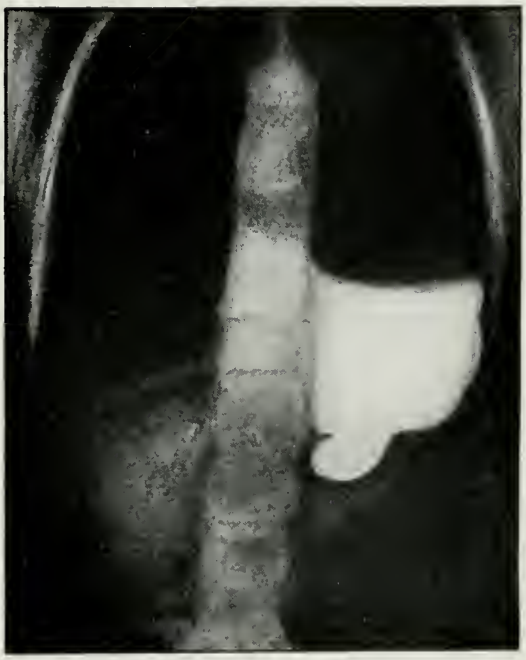

*Fig. A.*—Radiograph of diaphragmatic hernia of stomach, patient upright (*after Ware*).

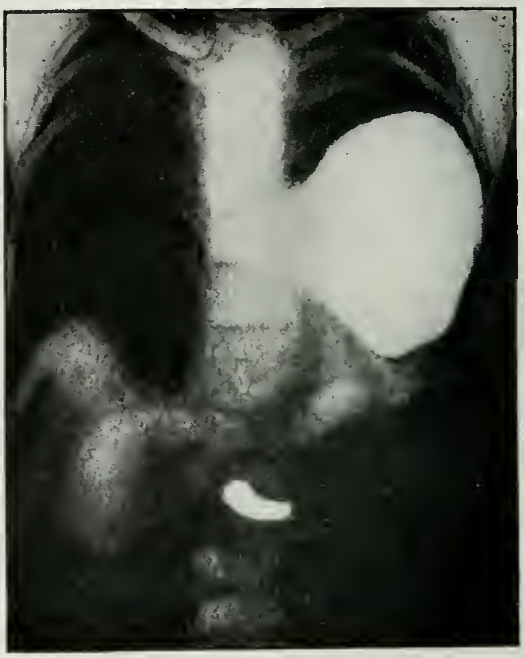

*Fig. B.*—Radiograph of diaphragmatic hernia of stomach, patient supine (*after Ware*).

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*'British Journal of Surgery'*

## DIAPHRAGMATIC HERNIA.

*Traumatic types*, especially those resulting from gunshot wounds, are discussed by Bryan[24] in a very thorough study. The immediate repair of these injuries falls under the head of military surgery, and will be discussed elsewhere. The late results, hernia, present difficult problems of diagnosis. There are two types, the acute and chronic. The acute type is nearly always fatal. After strangulation has once occurred, the time to save our patient has passed. These facts point to the importance of recognition of the condition in the quiescent stage and operation *à froid*. Further evidence of the deadliness of the disease is afforded by the fact that in the congenital type the vast majority of the cases reported died in early infancy.

The symptoms of the chronic type may be referable to the chest or abdomen, or both. As the stomach is nearly always the first organ involved, gastric disturbances are common. Vomiting usually occurs, rather shortly after meals. At times only liquid food is retained. Pain after meals is usually found, which may be referred to either the chest or abdomen. In several cases it was noted that both pain and vomiting were relieved if the patient remained lying down. The result is that profound cachexia and emaciation soon come on. Exercise makes the pain worse, and often brings on acute exacerbations. Cough and pain on deep inspiration are found generally. *X* rays are, of course, the only infallible method of diagnosis. (*See Plate XXV.*)

Bryan favours the thoracic or the combined abdominal and thoracic incisions to expose the orifice. Truesdale[25] also reports a case successfully treated by the thoracic approach. Borden[26] achieved a cure by the abdominal route in his case.

REFERENCES.—[1]*Ann. of Surg.* 1922, April ; [2]*Brit. Jour. Surg.* 1922, ix, 36 ; [3]*Zentralbl. f. Chir.* 1922, April 8 ; [4]*Ann. of Surg.* 1920, Dec. ; [5]*Ibid.* 1922, May ; [6]*Med. Record*, 1922, Jan. 21 ; [7]*Deut. Zeit. f. Chir.* 1921, Nov. ; [8]*Arch. f. klin. Chir.* 1922, March 8 ; [9]*Deut. Zeit. f. Chir.* 1921, June ; [10]*Lyon Chir.* 1921, July ; [11]*Ibid.* 1921, Nov.-Dec. ; [12]*Jour. Amer. Med. Assoc.* 1921, Sept. 10, 897 (abstr.) ; [13]*Deut. Zeit. f. Chir.* 1922, Jan. ; [14]*Glasgow Med. Jour.* 1921, Aug. ; [15]*Presse méd.* 1922, April 8 ; [16]*Ann. of Surg.* 1922, Jan. ; [17]*Lancet*, 1920, Nov. 20 ; [18]*Clin. Jour.* 1921, Aug. 3 ; [19]*Policlinico*, 1921, April 15 ; [20]*Surg. Gynecol. and Obst.* 1922, Feb. ; [21]*Jour. Amer. Med. Assoc.* 1922, April 22, 1242 (abstr.) ; [22]*Ibid.* Feb. 25 ; [23]*Boston Med. and Surg. Jour.* 1922, June 29 ; [24]*Brit. Jour. Surg.* 1921, July, 117 ; [25]*Ann. of Surg.* 1921, Sept. ; [26]*Ibid.* 1922, March.

## HERPES ZOSTER.

*E. Graham Little, M.D., F.R.C.P.*

Montgomery[1] favours the view that the infection of herpes zoster enters the nerve terminals in the skin, and travels along the nerve-sheath until it strikes the ganglion pertaining to that nerve, and there grows, causing an acute inflammation in the ganglion, which in turn causes the eruption on the skin. He points to the unilateral glandular enlargement which ushers in the eruption, and draws an analogy with other infections, e.g., syphilis, that enter by the skin. He assumes that the virus is centralized in the gland, and suggests that that site is the most likely position in which to search for the specific micro-organism. He offers the interesting suggestion that variations in the intensity of the eruption are caused by the different lengths of the nerves to be traversed : in short nerves like the ophthalmic division of the fifth, the inflammation is more severe than when a long nerve, going half round the body, is the point of entry. He hazards the suggestion that the bacterium is a streptococcus, chiefly on the ground that a scattered vesicular eruption is more likely to be streptococcic than anything else.

Corson and Knowles[2] report a very remarkable case of herpes zoster with a simultaneous eruption on the right forehead, supra-orbital, and under the right breast, the latter occupying the sixth dorsal segment. Both eruptions were unmistakably herpetic. This patient had been taking arsenic for several weeks previously. The authors report a second case in which simultaneous eruption of true herpes zoster appeared on the left side of the face and in the supraclavicular, infraclavicular, and suprascapular regions on the same side, with a concomitant left facial palsy. The herpes distribution was thus in the third and fourth cervical segments. Involvement of contiguous segments is much more common than of segments separated by an interval.

References.—[1]*Arch. of Dermatol. and Syph.* 1921, Dec., 812; [2]*Ibid.* 1922, May, 619.

## HICCOUGH, EPIDEMIC.

*J. Ramsay Hunt, M.D.*

Diaphragmatic spasms in animals produced with a streptococcus from epidemic hiccough are reported by Rosenow.[1] The etiology is obscure. Its occurrence at times in epidemic proportions suggests a microbic origin. Epidemiological and clinical facts suggest that the cause is similar to that of epidemic encephalitis. Hiccough frequently occurs in cases of epidemic encephalitis. The two diseases occur simultaneously in many localities and over widespread areas of population. Epidemic encephalitis has occurred in persons who have had recent attacks of uncontrollable hiccough, as well as after prolonged contact with patients with epidemic hiccough.

Mindful of the extreme specificity of bacteria isolated from various foci of infection in other diseases, Rosenow thought that such areas might harbour the etiological agent of epidemic hiccough. Three patients with prolonged uncontrollable hiccough have been studied from this standpoint. The tonsils appeared normal on inspection; but a considerable amount of pus was expressed from each, and a suspension of the pus obtained was made in 2 c.c. of salt solution. Washings from the nasopharynx, and suspensions of pus from pyorrhœa pockets, were also studied. From these, blood-agar plate and glucose-brain broth cultures were made. Animals were inoculated directly with the suspensions in salt solution, and with the cultures in glucose-brain broth. From 0·01 to 0·2 c.c. of the salt solution suspension, and from 0·001 to 0·2 c.c. of the culture in glucose-brain broth, were injected intracerebrally into rabbits and monkeys.

After a period of incubation lasting from one to seven days, depending largely on the size of the dose and the virulence of the strain, a remarkable train of symptoms developed, in which rhythmic clonic spasms of the diaphragm varied greatly in severity and duration. In some animals the spasms were mild and were noted for short periods at one or more intervals only, and recovery was the rule. In others they were intense, associated with hiccough, and continued with little interruption for many hours, often to the point of complete exhaustion of the animals. Control experiments with material from similar sources were negative.

The mononuclear cells usually predominated. The vessels of the meninges were congested. The pia over the base of the brain, pons, medulla, and more rarely over the cerebellum, was œdematous and slightly cloudy. Usually no gross hæmorrhages were found in brain or cord. Occasionally, circumscribed areas of hæmorrhage and infiltration were found in the cortex, especially in the lower Rolandic area, in the medulla, and in the cervical cord at the point of exit of the anterior roots of the upper cervical nerves. There was seldom any mark at the point of injection in the right frontal lobe. Suppurative meningitis was rare. No lesions were found in the phrenic nerves, and only occasionally hæmorrhages in the diaphragm. The microscopic findings in the main consisted of circumscribed areas of hæmorrhage, necrosis, and leucocytic and round-cell infiltrations, usually surrounding blood-vessels;

the type of lesion varied according to the duration of the experiment, although round-cell infiltration usually predominated, even in the experiments of short duration. The lesions were most marked in the basal ganglions, in the walls of the ventricles, and in the grey matter of the cortex and medulla. Bacteria were easily demonstrable in the more acute lesions, but in the more chronic ones they were fewer and could be found only after prolonged search.

The organism isolated from the brain and spinal fluid of the animals that developed hiccough following injections of material from each of the three patients was a Gram-positive, non-encapsulated diplococcus, which produced small, non-adherent greenish colonies on blood-agar plates, and short chains in liquid mediums. Cultures from the blood and other tissues were usually sterile, or contained few bacteria as compared with the brain and cord.

The close relationship between epidemic hiccough and epidemic lethargic encephalitis, noted clinically, was suggested not only by the similarity of these strains to those he has isolated in encephalitis, but also by the results in the animal experiments. It was noted that, after several animal passages, fewer animals developed hiccough, and a larger proportion developed lethargic and other symptoms of encephalitis.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1921, June 18, 1745.

## HIP-JOINT, DISEASES OF. (*See* Bones and Joints, Surgery of.)

## HOUSING ACTS.

*Joseph Priestley, B.A., M.D., D.P.H.*

An important and far-reaching decision has been given during 1922 by the High Court in connection with Section 28 of the Housing, Town Planning, etc., Act 1919 (*Borough Council of Battersea* v. *Haines and others*). It was claimed that the Borough Council was entitled, under the section named, to a charge on certain premises for a sum of £200 3s., and that such charge was entitled to take precedence or priority over any other mortgage or encumbrance on the premises. An order for sale was asked for by the Borough Council at the same time. Under Section 28 of the Housing Act 1919, a notice is to be served upon the owner (the definition of 'owner' being the same as that laid down in the Public Health Act 1875) calling upon him to carry out the necessary works (set out in a schedule) to put a particular house in such a state as to render it reasonably fit in all respects for human habitation. There is an appeal to the Ministry of Health, but, failing such appeal and failing the work being done, the Borough Council (as the Local Authority) has the right to enter upon the the premises and to do the work required at a cost to rank afterwards, if necessary, as a charge upon such premises. In the Battersea case, the defendant was not limited to the 'owner', upon whom the notice had been served, but included also the freeholder, leaseholder, and mortgagee—in fact, all persons having any proprietary interest in the premises. The house concerned might have been voluntarily closed by the owner in the event of the requirements of the Borough Council including structural work ; but this point was not raised within the time limit mentioned in the Act. The case was therefore a straightforward one. A house (working-class dwelling) was in such a state as not to be reasonably fit in all respects for human habitation. A notice (and schedule) was served upon the owner, who failed to do the works required. The Borough Council stepped in and did the work at a cost of £200 3s., which the owner refused to pay. Application was made to the Police Court, and an order obtained against the owner for payment. The Police Court order was disregarded, with the result that the Borough Council made application to the High Court for a charge on the premises and an order for the sale of such premises. The application and order were granted—the charge to have priority over the mortgage charges and encumbrances (if any) Costs were granted, and a further order made for all deeds and documents to be handed over to the Borough Council as the plaintiff in the action.

The outstanding feature of the decision is the simplicity of administration under Section 28 of the Housing Act 1919, requiring the notice to be served only upon the 'owner' (as defined under the Public Health Act 1875)—freeholders, leaseholders, mortgagees, etc., having, apparently, no proprietory interests as far as such Section 28 of the Housing Act 1919 is concerned.

## IMPETIGO CONTAGIOSA.

*E. Graham Little, M.D., F.R.C.P.*

Simey[1] has some good practical suggestions as to dealing with the spread of impetigo in schools. The hair should be kept short and pomades avoided. Brushing of the hair thoroughly should be insisted on in the morning toilet, and finger nails kept short and clean. Shaving too soon after a football match is suggested as a method of spread. The victim of an infection should be put under treatment immediately ; and as well as the local treatment, for which **Dilute Nitrate of Mercury Ointment** is the author's choice, the general health is to be considered, tonics and liberal feeding, and a stay at the seaside, being useful adjuvants. **Vaccines** in some cases are especially useful, mixed streptococcal and staphylococcal strains being recommended.

Reference.—*Lancet*, 1922, i, 738.

## INDUSTRIAL DISEASES (Lead Poisoning). (*See also* Anthrax and its Prevention.)

*Joseph Priestley, B.A., M.D., D.P.H.*

There has recently been published by H.M. Stationery Office, Kingsway, W.C., a book dealing with the *Laws and Regulations relating to Lead Poisoning*, by Gilbert Stone. All knowledge in regard to lead poisoning is brought up to date, and certain statistics (official) are published that prove the value of the preventive measures suggested from time to time and taken in Great Britain. Thus, in the white-lead industry, the annual averages of cases in 1900–4 and 1915–19 were 183 and 17 respectively : whilst in the pottery trade it was reduced from 445 in 1896–8 to 119 in 1900–4, to 67 in 1910–14, and to 19 in 1915–19. The period covered by the statistics is one of great industrial expansion (increased numbers of workpeople employed), and has also seen the introduction of the Workmen's Compensation Act 1907, under which industrial lead poisoning is defined as an accident. Under this Act there has been a natural tendency in consequence to notify *mild* cases ; thus, severe cases notified were 33·2 per cent in 1900–4, falling to 18·4 per cent in 1910–14 ; whilst moderate cases were, during the same periods, respectively in averages 20·8 per cent and 32·2 per cent. Great Britain shows up well in comparison with other countries, where the seriousness of lead poisoning as an industrial problem does not appear to have been sufficiently realized.

## INFANT FEEDING.

*Frederick Langmead, M.D., F.R.C.P.*

All are agreed as to the advantages of **Human Milk**, and the need for procuring it in certain cases of difficult feeding and weakly infants. Wet nurses are not easy to obtain, few in number, expensive, and likely to make trouble. To overcome this difficulty, as P. W. Emerson[1] records, the Boston Floating Hospital has for many years collected human milk daily in the mothers' homes. In the summer of 1915, within eighty days, 368½ quarts were thus obtained. A complete social and medical history of the mother is elicited in each case, and a Wassermann test is done. She is instructed and provided with a breast pump, or taught the technique of manual expression, and each day sterile bottles are brought to her. Each bottle as it is filled is placed on ice. The nurse who collects it carries an ice-cap in her bag to keep it cool, and finally all the bottles are brought to the hospital, where the milks are mixed, pasteurized, and placed in a refrigerator.

He discusses the possibility of drying human milk so as to obtain a more constant supply and to enable it to be preserved. Mayerhofer and Pribram added calcium peroxide to human milk and then dried it, with and without the fat-content, and in some cases babies were fed on this milk with success. Condensing human milk by evaporation and adding sugar as a preservative proved impracticable.

Another method was tried, the fat alone being preserved and afterwards homogenized with cows' skim milk. A 12 per cent fat was prepared from human milk and combined with cows' skim milk, lactose being added to provide the following formula: Fat 3 per cent, sugar 7 per cent, protein 1 per cent. It proved successful in a single case in which it was given. It is suggested that such a milk might be used with advantage for babies who have an intolerance for cows' milk fat; but it is expensive and difficult to prepare. Human milk fat can be preserved for at least a month.

Eric Pritchard[2] recommends the use of a **Vegetable and Meat Broth** to supplement diluted cows' milk, and states that his results have been considerably improved thereby. He advocates sterilizing of cows' milk, and in adding the broth he has in view the providing of accessory food factors which may not be in sufficient amount after dilution of the cows' milk. The feeds are prepared according to the following formula: Milk (of average quality), 10 oz.; cream (33 per cent), 1 oz., or cream (48 per cent), $\frac{3}{4}$ oz.; sugar (milk sugar at first, but later milk sugar, maltose, and cane sugar mixed), 1 oz.; broth, 4 oz.; water to make 1 pint. The milk thus prepared has a calorie value of 20—i.e., the same as that of human milk.

The broth is made thus: Take 1 lb. of bones and chop them up well so as to open up the marrow cavity, add one tablespoonful of vinegar and $1\frac{1}{2}$ pints of water, allow to simmer for about eight hours, and then add a handful of mixed vegetables, such as cabbage, Brussels sprouts, spinach, roots, lentils, etc., with a few sprigs of Irish moss, and allow to simmer for one hour longer. Then strain and allow to set into a jelly. Such a broth, besides gelatin and animal extractives, also contains a considerable number of vegetable extractives, possibly vitamins, lecithin bodies, organic salts, and cholesterol. The Irish moss is to provide iodine, and the vinegar to dissolve out the calcium salts and supply them in a highly available condition. He thinks that it may be wise to give orange-juice independently.

The time necessary for preparation, the cost of the ingredients, especially in winter, and the cost of the necessaryt herms or coal, make the method 'caviare to the general', who most need it.

J. P. Crozer Griffith[3] writes favourably of his experience of the Czerny-Kleinschmidt **Butter-Flour Food**, which contains the following: 7 grm. of butter, 7 grm. of flour, 5 grm. of sugar, and 100 c.c. of water, to be mixed with varying amounts of milk according to the age and weight of the patient. To simplify the preparation in the ordinary household, Griffith worked out the equivalents in common measures, and gives the following description of its preparation: A small amount of butter is placed in a glass, and this is stood in warm water until the butter melts. The mixture is then constructed by using 2 tablespoonfuls of melted butter, $2\frac{1}{2}$ level tablespoonfuls of flour, $1\frac{1}{2}$ level tablespoonfuls of cane sugar, and 10 fluid ounces of water. Not more than about 3 fluid ounces per pound weight of the child should be allowed daily. The mixture is advocated especially for weakly or premature infants.

References.—[1]*Jour. Amer. Med. Assoc.* 1922, Nov. 4, 641; [2]*Lancet,* 1922, i, 838; [3]*Therap. Gazette,* 1921, Nov., 773.

## INFANTILE PARALYSIS, ACUTE. (*See* POLIOMYELITIS.)

## INFLUENZA.

*J. D. Rolleston, M.D.*

BACTERIOLOGY.—No finality has yet been reached as regards the causal agent of influenza, as is shown by the discussion in which M. H. Gordon[1] and J. McIntosh[2] took part at the recent meeting of the British Medical Association in Glasgow. Gordon has grown an ultramicroscopic parasite from the filtered secretions of influenza patients; he has been able to detect these minute particles in fresh influenza secretion, and he has succeeded in staining the virus recovered in his cultures. Though he does not claim that this ultramicroscopic virus is the undoubted cause of influenza, he has proved that it is present, and that with the necessary technical skill it can be recovered constantly from influenza and common colds (*see also* MEDICAL ANNUAL, 1919, p. 203; 1920, p. 182; 1922, p. 225). On the other hand, McIntosh, who found *B. influenzæ* (Pfeiffer) as the predominating organism in the secretions and lesions of the late epidemic, was unable to find any evidence in support of the view that influenza is due to a filter-passing virus.

In a paper on the incidence of infections with Pfeiffer's bacillus before, during, and after the 1918 epidemic, J. W. McLeod, A. G. Ritchie, and C. A. Dotteridge[3] conclude that the bacillus is relatively rare in periods remote from epidemics; its virulence is exalted by frequent passage in numerous localized epidemics in the years immediately preceding a major epidemic, and then reaches a high degree of infectivity which enables it to affect a very large proportion of the community. As a result of rapid increase of its virulence, a fulminating illness is produced with a characteristic lesion rarely seen at other times.

SYMPTOMS AND COMPLICATIONS.—Two cases of *hyperpyrexia* during influenza without any visceral localization are reported by E. T. Glenny[4] and W. G. McKenzie[5] respectively, in women of 22 and 42. The temperature, which in the first case rose to 114° and in the second to 113°, was regarded as genuine by the writers, and by Dr. Carey Coombs, who was called in consultation in each case. Both recovered.

P. Tristan[6] describes the following four varieties of the *gastro-intestinal form* of influenza: (1) Pure gastric form; (2) Pure intestinal form; (3) A mixed gastro-intestinal form; (4) A form characterized by gastro-intestinal hæmorrhages. Old gastro-intestinal affections, such as gastric ulcer or amœbic dysentery, are liable to be roused into fresh activity by an attack of influenza.

G. Laroche and Deglaire[7] record a case of *gangrenous vulvovaginitis* following severe influenzal bronchopneumonia in a woman, age 57. No bacteriological examination was made, but rapid and complete recovery followed two intramuscular injections of a serum composed of equal proportions of the organisms commonly associated with gangrene.

W. Odermatt[8] reports a fatal case of *multiple venous and arterial thrombosis* causing gangrene of both feet and hands, the tip of the nose, and various parts of the skin, in convalescence from a mild attack of influenza in a previously healthy woman, age 29. Death took place from collapse. The condition was attributed to spasmodic vascular occlusion which the enfeebled heart was unable to overcome.

G. Roello[9] describes two cases of influenza in children, 13 months and 3 years old respectively, complicated by *suppurative arthritis*, the right shoulder being involved in one case and the left elbow and right hip in the other. Complete recovery took place in the first case, in which Gram-negative diplococci were found, while in the second case, in which a diplostreptococcus was isolated, 2 cm. shortening of the lower limb resulted.

R. J. Rowlette[10] draws attention to a hitherto undescribed complication of influenza consisting in a *myositis* of the cervical muscles. The muscles chiefly affected are those attached to the lower jaw and the tongue ; any movement of the jaw or tongue or any movement of the head is intensely painful and difficult. Swallowing is especially painful, and even talking is difficult. The condition passes off in a few days. It is much relieved by the application of heat, and is exacerbated by exposure to cold.

O. Klein[11] records six cases of *polyneuritis* which developed three weeks after the acute symptoms of influenza had subsided; they were characterized by spontaneous pain, marked tenderness of the muscles and nerve trunks, disturbances of the reflexes, and in severe cases by flaccid paralysis of symmetrical distribution, with partial reaction of degeneration. Sensory disturbances were shown by a combination of hyperalgesia of the skin and hyperæsthesia to touch and temperature, with disturbance of stereognosis. Three cases showed a combination of polyneuritis with symptoms of encephalitis, and in one of these cases poliomyelitis was also probably present as well. All the cases responded well to treatment except those whose symptoms were probably due to poliomyelitis.

H. Curschmann[12] describes three cases of post-influenzal *spasm of the glottis and deglutition*, which occurred principally at night without any special psychical cause, accompanied by a violent swallowing of air, in the absence of all signs of bronchial asthma, tetany, tabes, polyneuritis, encephalitis, or whooping-cough. Curschmann attributes the attacks to a transient ascending irritation of the sensory fibres of the superior laryngeal nerve caused by influenzal laryngo-tracheitis.

G. C. Bolten[13] draws attention to a train of symptoms which occur during or after an attack of influenza and indicate *damage to the sympathetic*, viz., fall of blood-pressure, loss of hair, cyanosis of the hands and fingers, profuse sweating, aeroparæsthesia, etc. Those phenomena are sometimes very persistent, and are best treated by the administration of **Thyroid Extract** or **Adrenalin**, which contain the most powerful hormones for improving the tone of the sympathetic.

According to T. M. Rivers,[14] who has collected 197 cases from literature in addition to 23 new cases, *influenzal meningitis* is a disease of infancy, 79 per cent of the cases occurring in patients under two years of age. The mortality in 220 cases was 92 per cent. Of the 17 cases who recovered, 12 were two years of age or older. There is no typical clinical picture of influenzal meningitis, and many cases are probably overlooked. In most instances it appears to be a primary disease produced by a group of bacilli which are closely allied to each other, and differ from the ordinary respiratory strains of *B. influenzæ* particularly in their serological reactions and in their pathogenicity for rabbits.

S. E. Denyer[15] records a case of *papillitis* developing in convalescence from influenza in a girl, age 17, the symptoms being blindness of rapid onset, and frontal and temporal pain. The sight was gradually recovered in the course of three or four weeks.

A. W. Panton[16] describes a case of *recurrent vesicular eruption* after influenza in an adult, six attacks, each lasting two days, occurring at intervals of six to eight days. No article in the food could be incriminated, and Panton regarded the case as probably an example of toxæmia of influenzal origin.

Treatment.—D. Simici[17] recommends the use of the **Whole Blood** of convalescents in place of their serum, which is more difficult to obtain (*see* Medical Annual, 1921, p. 265). The technique consists in injecting subcutaneously or intramuscularly 10 to 20 c.c. of blood which have been withdrawn from a patient convalescent from a severe attack of influenza in which the temperature has been normal four or five days; 2 c.c. of a 2 per cent solution of sodium citrate should be drawn into the syringe and well mixed with the blood so as to prevent clotting. Of 24 severe cases of influenza treated by this method, 20 recovered and 4 died. The effect of the treatment is shown by its favourable action on the temperature, general condition, and respiration, and the increase in diuresis.

Since 1891 E. B. Turner[18] has treated more than 3054 cases of influenza in persons from 16 to 74 years of age with large doses of **Salicin**—20 gr. every hour for twelve hours, and then 20 gr. every two hours for the next twelve hours—with the same results: "No ill effects from the salicin; no complications, no sequelæ, no deaths". (*See also* MEDICAL ANNUAL, 1919, p. 209; 1920, 187.)

REFERENCES.—[1]*Brit. Med. Jour.* 1922, ii, 299; [2]*Ibid.* 303; [3]*Quart. Jour. Med.* 1921, 327; [4]*Brit. Med. Jour.* 1922, i, 434; [5]*Ibid.* 601; [6]*Med. Science*, 1922, vi, 370; [7]*Bull. Soc. méd. Hôp. de Paris*, 1922, 294; [8]*Schweiz. med. Woch.* 1922, 408; [9]*Med. Science*, 1922, vi, 369; [10]*Med. Press and Circ.* 1922, ii, 52; [11]*Med. Science*, 1922, vi, 368; [12]*Deut. med. Woch.* 1921, 149; [13]*Nederl. Tijds. v. Geneesk.* 1922, i, 2255; [14]*Amer. Jour. Dis. Child.* 1922, ii, 102; [15]*Brit. Med. Jour.* 1922, i, 223; [16]*Ibid.* 995; [17]*Paris méd.* 1922, i, 474; [18]*Brit. Med. Jour.* 1922, i, 641.

## INSULIN. (*See also* DIABETES MELLITUS.) *John D. Comrie, M.D., F.R.C.P.*

A short note upon this remedy, stating its nature and origin, is given in the article on DIABETES MELLITUS, p. 134. The pharmacological assay of the hormone is important, and it is explained by Macleod[1] that one unit of insulin is the amount that on subcutaneous injection into a rabbit weighing about 2 kilos can lower its blood-sugar to 0·045 per cent; the insulin as prepared is concentrated, so that 1 c.c. contains one unit. The reason why this figure (0·045 per cent of blood-sugar) is chosen is because at this point the rabbit will develop characteristic symptoms of convulsions and coma, from which, however, it can be recovered by injections of dextrose. Careful dosage is necessary in order to prevent similar untoward results in the human subject. It is pointed out by the Medical Research Council,[2] who for the time are superintending the use of the remedy in Great Britain, that further research is urgently needed in order to improve the methods of preparation and administration and to determine the limits of efficacy—whether by any new method of application it can effect a permanent cure, or whether, as hitherto, it can act only to relieve the incurable defect of sugar storage temporarily after each injection. Sherrington[3] indicates the fact, of much physiological interest, that the active principle in the insulin extract seems to be one that *normally* controls the blood-sugar in health; for the extract, added to a simple perfusion fluid containing a little glucose and streamed through the isolated rabbit heart, increases three- or four-fold the heart's uptake of glucose from the fluid.

Roberts[4] makes some criticism of the preparation methods employed by Banting and Best, his conclusion being that it would appear from their researches that the effect of an extract from the whole gland (pancreas) is greater and more lasting than that of extract from the degenerated gland used by them; thus, if his contention be correct, it may be possible to produce insulin more easily and in greater amount than is at present the case. As an illustration of the present difficulties restricting its preparation, Leyton[5] points out that a single dose requires half an ox-pancreas and about three quarts of alcohol.

Banting, Campbell, and Fletcher[6] publish some clinical results obtained in the treatment of 50 cases of diabetes mellitus with insulin. Some of these have been under treatment for several months, and the best results have been obtained in children and young adults. They state that if sufficient insulin is given, the urine becomes sugar-free on the first or second day of treatment, and on the second or third day ketone-free, while the patients feel increasing strength before the end of the first week. Some patients have been able to return to work after a month of treatment. The authors give in detail the record of a case of two years' duration in a man, age 25 ; it is apparently one of mild diabetes, the patient passing 4 litres of urine daily, with 38 to 75 grm. of glucose and specific gravity 1010 to 1016 ; the blood-sugar was 0·215 per cent. He was put on a diet containing 36 grm. protein, 140 grm. fat, and 41 grm. carbohydrate, and received three daily injections of 2 c.c. insulin. After the first day of treatment his urine has remained free from sugar and ketone. Six weeks later he was discharged to work, continuing to receive 3 c.c. of insulin daily ; and six weeks later still the urine remained free from sugar and ketone on a diet of 36 grm. protein, 140 grm. fat, and 61 grm. carbohydrate.

These writers consider that one of the most valuable properties of insulin is its effect in diabetic coma. Of 10 cases of coma treated, 4 died and 6 recovered. Among the 6 who recovered, 5 have remained free from symptoms and with the urine clear of sugar and ketone under dietetic treatment and daily administration of insulin, while one case remains free from sugar on a diet about double the basal requirement without insulin.

They give a warning against the danger of hypoglycæmia, i.e., the reduction of blood-sugar below the normal amount, following an overdose of insulin. They have found that, when the blood-sugar falls to 0·07 per cent, nervousness, tremors, and sweating appear ; at about 0·05 per cent there may be mental confusion ; and at about 0·032 per cent coma with loss of reflexes appears. These reactions can be relieved immediately by administration of food, e.g., 50 to 100 c.c. of orange-juice containing 5 to 25 grm. of glucose ; or, if the patient is unconscious, by injection of 1 c.c. of 1–1000 epinephrin solution followed by glucose. They consider that, in estimating the optimum dosage of insulin for any given case, the aim should be to reduce the blood-sugar to about the normal level.

Mackenzie Wallis[7] records three cases of diabetes in which satisfactory results in the abolition of glycosuria were obtained from dietetic restriction combined with administration of pancreatic extract (not insulin) by the mouth.

References.—[1]*Brit. Med. Jour.* 1922, ii, 833 ; [2]*Lancet*, 1922, ii, 1086 ; [3]*Brit. Med. Jour.* 1922, ii, 1139 ; [4]*Ibid*, 1193 ; [5]*Ibid.* 1143 ; [6]*Ibid.* 1923, i, 8 ; [7]*Lancet*, 1922, ii, 1158.

## INTESTINAL STASIS. (*See* Intestines, Surgery of ; Skin Diseases, General.)

## INTESTINES, SURGERY OF. (*See also* Hernia.)

*E. Wyllys Andrews, M.D., F.A.C.S.*

### Acute Obstruction.—

*The Symptom Complex of Toxæmia.*—Van Beuren[1] calls attention to the distinction between intestinal obstruction and ileus. The former is a local condition, stoppage of the intestinal current at a certain point. Ileus, however, has a decidedly different significance. It is a general bodily condition, a symptom-complex of toxæmia, which arises as a result of acute intestinal obstruction, but may be initiated by a number of other causes. The toxæmia is due to products absorbed from the upper intestine, especially the lower duodenum and upper jejunum. Ellis,[2] in a study of this toxin, has made some interesting observations, and points some important analogies. He isolated the poison (by precipitation with alcohol and extraction with boiling water) from the contents of the obstructed jejunum. By this process all bacterial or septic action is excluded. The substance was not acted upon by erepsin, and therefore was not in the class of proteoses. It was not present in the intestines of normal animals. It could also be obtained in large amounts in the intestines of animals with peritonitis, pancreatitis, and portal obstruction, and in the toxæmia resulting from adrenalectomy. It seems to be elaborated chiefly in the duodenum.

Wilkie[3] points out that obstruction in the lower bowel is not harmful *per se.* Even isolated loops of lower ileum or colon were not incompatible with life in his experiments. Only when the damming back had reached the ‘ poisonous proteose level ’ do symptoms of ileus come on. This agrees with the clinical phenomena of large-bowel obstruction.

Elsberg[4] has repeated a very large number of the experiments done by other workers, and has added several of his own. He believes that we are dealing with two different toxins. One is evolved in the pancreas, or at least from pancreatic ferments, and is the lethal agent in acute pancreatitis and very high obstruction cases. The other originates in the intestinal mucosa, and is responsible for the toxæmia in lower obstruction, and especially in cases where there is injury or devitalization of the bowel wall. He does not place bacterial action as a very important factor.

Gerard[5] gives us an excellent review of the recent literature on this subject, and a summary of its present status. Particular emphasis is laid upon the work of Dragstedt and his co-workers. The toxic agent is in all probability a protein derivative. Oxidation products of bile salts, cholesterin, or other lipoids may, of course, be present and add to the toxicity of the fluid, but none are as potent or produce the same symptoms, and therefore they are of secondary importance. Bacterial toxins cannot be the offending agents, as they are not thermostable.

Histamine seems to have been proved to be the prime factor. Histamine can only result from bacterial action. Some late work has proved that if a segment of bowel be excluded and dropped into the belly with the ends open, the dogs who survive the peritonitis do not suffer from ileus if the loop is closed after sterilization has thus taken place. This experiment thus proves that bacterial action is necessary for the manufacture of the toxin producing ileus. Additional evidence is supplied by the fact that the material in an open loop is non-toxic if injected at once; but if incubated *in vitro* for a few hours and then injected, the typical picture of ileus is produced.

Thus the first link in the evidence implicating histamine is that bacterial action is needed. Histamine is produced only by bacteria. It arises from proteoses. It is known that proteoses are present, but after their removal the fluid is still toxic. Next, histamine has been isolated from the loop fluid, from the stools, from the intestinal mucosa, and from the chyle, both in dogs and in fatal human cases. The table on the following page is self-explanatory.

Histamine is, however, not absorbed from the normal intestine. It is not a product of protein-splitting by enzymes but only by bacteria. This fact explains the results of the enormous amount of work done by many investigators, on the point that injury to the mucosa is necessary for the production of ileus. By many this had been interpreted to mean that the poison was evolved in the mucosa. This assumption we now see was wrong. The fact remains, however, that histamine will pass through the lumen of the intestine harmlessly or will even lie in a loop unabsorbed. If, however, the mucosa is devitalized by trauma, increased pressure, or any other means, intoxication will occur.

Bacon, Anslow, and Eppler,[6] noting the increased concentration of the blood shown in the table, have attempted to counteract this by extensive administration of fluids, and were thus able to save many of their animals. Luckhardt's[7] observations in parathyroid tetany, which seems to be due to a toxin of intestinal putrefaction, are of interest in this connection. It is known that the amount of protein in the diet is a determining factor in the toxæmia following parathyroidectomy, increased blood concentration being a prominent feature of the disease. He injected very large amounts of Ringer's solution, and was able to keep dogs alive indefinitely after parathyroidectomy.

EFFECT OF INTRAVENOUS INJECTION OF OBSTRUCTION FLUID, HISTAMINE, AND PROTEOSE.

| OBJECT AFFECTED | EFFECT | |
|---|---|---|
| | Obstruction fluid | Histamine |
| Blood-pressure | Fall, rise above normal, and prolonged fall | Fall, rise above normal and prolonged fall, in cat |
| Temperature | Prolonged fall | Prolonged fall |
| Respiration | Rapid, then slow and laboured | Rapid, then slow and fails |
| Heart | Slowed | Slowed |
| Pupils | Dilated | Dilated |
| Secretion | Increased vomiting, salivation, bloody diarrhœa, pancreatic secretion | Increased vomiting, salivation, bloody diarrhœa, pancreatic secretion |
| Lymph flow | Rapid | Rapid |
| Coagulability of blood | Decreased | Slightly decreased; proteose gives a decrease |
| Concentration of blood | Increased | Increased |
| Skeletal muscle | Tremors and rigidity | Rigidity |
| Cats | Resistant | Resistant |
| Guinea-pigs | 'Histamine shock' with dyspnœa | 'Histamine shock' with dyspnœa |
| Immunity | Non-antigenic | Non-antigenic; proteose is probably non-antigenic |
| Intestinal strip | Contracts | Contracts |
| Necropsy | Great engorgement of intestinal mucosa, especially in the duodenum | Great engorgement of intestinal mucosa, especially in the duodenum |

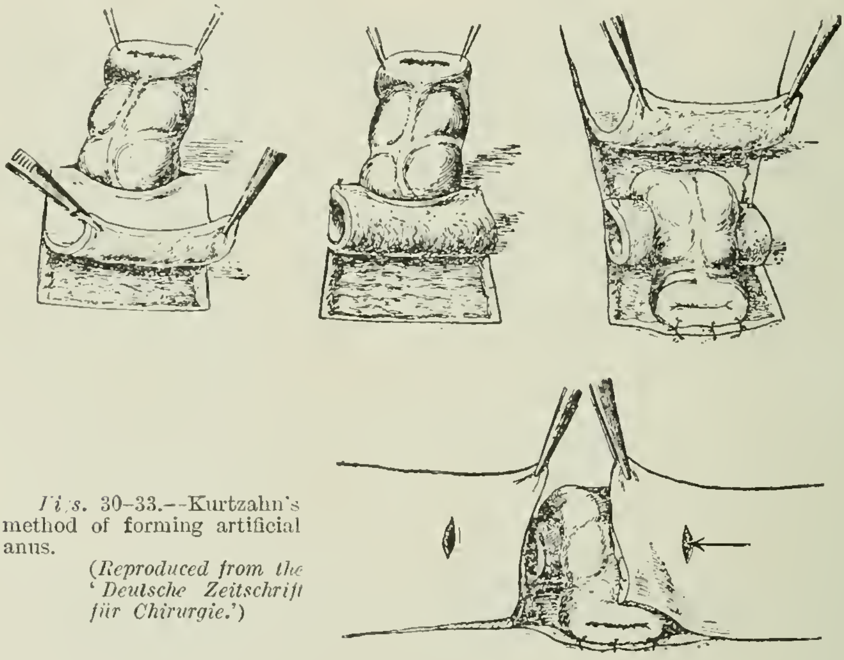
TREATMENT.—

In the treatment of acute intestinal obstruction, **Jejunostomy,** apart from obtaining more theoretical justification by such facts as the above, has been proving its worth as a clinical measure. Papers advocating this procedure have appeared by McKinnon,[8] Vollhardt,[9] Dubs,[10] Brunner,[11] Delore and Conrozier,[12] Wortmann,[13] and Walker.[14] The operation is of value in ileus from any cause. Drainage of the toxic contents of the duodenum may be necessary in peritonitis, intestinal obstruction, or certain reflex conditions. All the authors agree that it is only necessary in a small minority of cases, namely, those where the bowel has already been intoxicated to such an extent that it cannot sweep these toxins onward or reject them by vomiting. It must be remembered that these poisons will not be absorbed from the lower intestine, and so they become innocuous as soon as normal peristalsis begins. Therefore it is only in the absence of such peristalsis that any indication for enterostomy exists. The operation should always be under local anæsthesia. Ether enhances the virulence of these poisons, and furthermore the temporary paralysis of the intestines from ether is a common observation. Only too often an intestinal fistula made for the drainage of toxic material will not discharge at all for a day or two until the effect of the ether has worn off. Certainly in these cases the jejunostomy cannot be said to have saved the patient, in whom the first days are the critical ones. He has, on the contrary, got well in spite of the operation.

Formerly the opening was made just above the point of obstruction, with the idea of draining the most distended segments of the bowel. In the light of modern knowledge, the tendency is to make it as high as possible, on the assumption that here are the most virulent toxins. This, of course, usually means a separate incision, the jejunostomy being secondary to the removal of the obstructing or infecting focus.

The results reported by most of the above authors are not such as to lead us to consider this procedure as a cure-all. The mortality in most of the series was about 50 per cent. Due allowance must, however, be made for the fact that most of these patients were *in extremis*, and were of a type where an even higher mortality would be expected with less radical means of therapy.

**Colostomy** is strongly recommended by Stiles[15] as a preliminary to operations on the colon. He believes that in all cases of acute obstruction it is dangerous to resect or anastomose about an obstruction while the bowel is distended and devitalized. A far better plan is to establish a cæcostomy first. This is best done under local anæsthesia, and only a small opening is necessary, as the bowel contents at this level are liquid. The cæcum need not be lifted from the belly at all. A small Paul tube is all that is needed. Such a stoma will generally close spontaneously when the tube is removed. When the radical operation is performed ten days or two weeks later, conditions will be vastly more favourable for good wound healing. Most important of all, we have provided a safety valve which will effectually prevent distention and elevation of pressure in the gut, and an end-to-end anastomosis is justified. Without such a guarantee against pressure, end-to-end suture is much more dangerous than lateral. By this means it is often possible to make a more radical removal of a growth than one would dare to attempt if the ends had to be overlapped for a lateral anastomosis.



*Figs.* 30–33.—Kurtzahn's method of forming artificial anus.

(*Reproduced from the 'Deutsche Zeitschrift für Chirurgie.'*)

Permanent colostomy for the establishment of an *artificial anus* necessitates the provision of some mechanism to replace the lost sphincter control. It has been the reviewer's experience that the common methods of bringing the gut obliquely through the abdominal wall, piercing the rectus muscle, usually result in a continent outlet. Others have evidently not had this experience, because there is a constant succession of reports of ingenious but complicated methods to obtain this control. Unger and Schwabe,[16] Cunee,[17] and Kurtzahn[18] have each devised a way of constructing a tube of skin which passes under the bowel proximal to its outlet. Through this tube is passed a rod which serves as a firm support upon which a pad can be pressed. The pictures given (*Figs.* 30–33) are from Kurtzahn's paper. This is the simplest of the three methods.

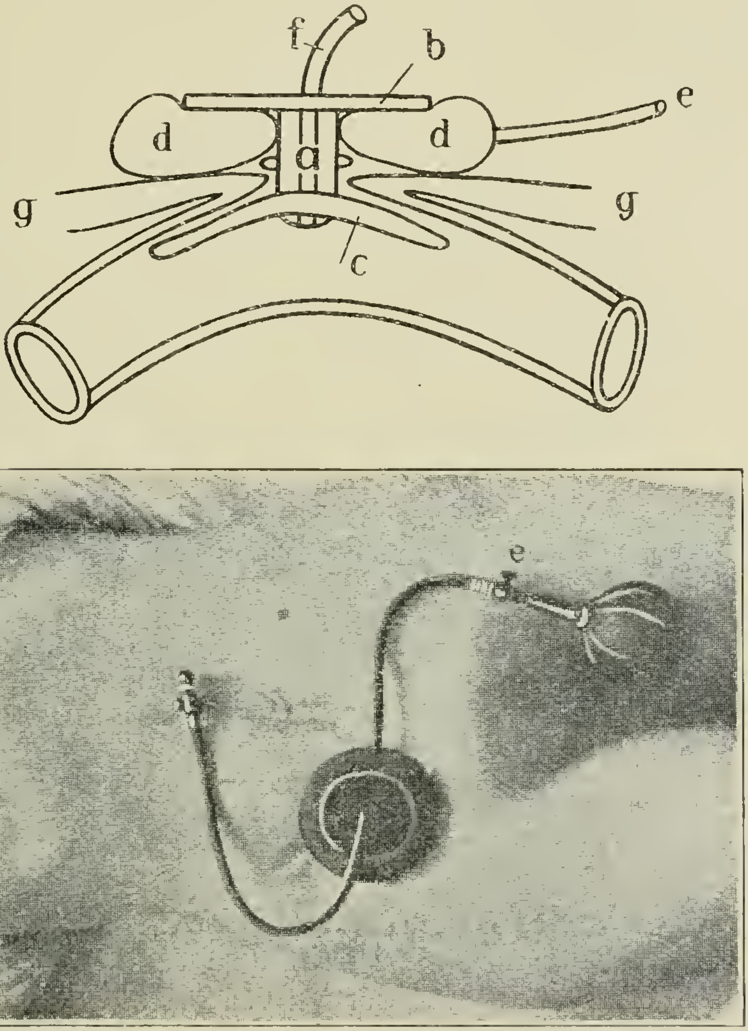


*Fig.* 34.—Drüner's method of pneumatic closure of artificial anus.

Kaiser[19] advises bringing the end of the bowel out under the skin of the thigh, then through or under the sartorius muscle, and establishing the opening just lateral to it. He claims the following advantages for this femoral anus: (1) Situation is anterior and hence easily accessible; (2) Firm support for application of a pad or other apparatus; (3) Continence from tension of sartorius; (4) Voluntary control; (5) No possibility of prolapse; (6) No tendency to closure.

Drüner[20] has devised the contrivance pictured above (*Fig.* 34) for use in those cases of artificial anus in which continence is not established.

The only pressure is pneumatic, and can be readily controlled by a small bulb.

**Intussusception** (*see also* p. 232).—Perrin and Lindsay[21] report 400 cases treated at the London Hospital since 1903, and Harper[22] 112 from the Children's Hospital in Boston. The results of these and other series show great uniformity.

Etiology.—The vast majority of cases occur between the ages of five to nine months. After four or five years of age the isolated cases which are met with generally have some very evident cause, such as the traction exerted by a Meckel's diverticulum or, as in those reported by Biggs[23] and Cope,[24] by intestinal tumours. In the vast majority of infantile cases the location is at the ileocæcal valve. The same type of cause is usually assigned to these cases. Instead of tumours, enlarged lymph follicles of the ileum are looked upon as the enlargements which are carried downward by peristalsis. This lymphatic growth in the terminal ileum reaches its maximum at the same period of growth (*Plates XXVI, XXVII*). It has often been demonstrated in post-mortem specimens. Strong, healthy, and especially fat infants are most liable. It has been noted that the Peyer's patches are larger in such infants.

Diagnosis is fairly easy, and can usually be made before operation. A strong healthy child is suddenly taken with a terrific belly-ache. He is rapidly prostrated. Pallor and cold sweats and thready pulse give evidence of the intensity of the shock. A bloody mucous stool is generally passed, following which obstruction is complete, enemas giving no results. Vomiting and symptoms of ileus soon appear. A mass is nearly always evident in the right iliac fossa. Acute appendicitis is the only disease likely to be confused with this, and as operation would be done in this disease anyway, the mistake is not serious. Absence of early signs of sepsis will usually distinguish the two.

Treatment.—*Operation* is the only therapy. Injection of air into the rectum and manipulations of the abdomen have not given good results. Reduction of the intussusception should be done slowly and gently by continuous traction, with as little manipulation as possible. About 85 per cent of cases can be thus reduced. Resection should only be done if the gut is completely gangrenous or if reduction is impossible. The reason for this is that, despite a few reports of recovery, the mortality has been nearly 100 per cent after such operations. Small areas of gangrene can be infolded. Lateral anastomosis, ileostomy, and all other measures also have practically 100 per cent mortality. Of the cases in which reduction was possible, about 22 per cent died. The duration of the disease is of great moment. Far more of the earlier cases survived. This shows the great importance of early diagnosis.

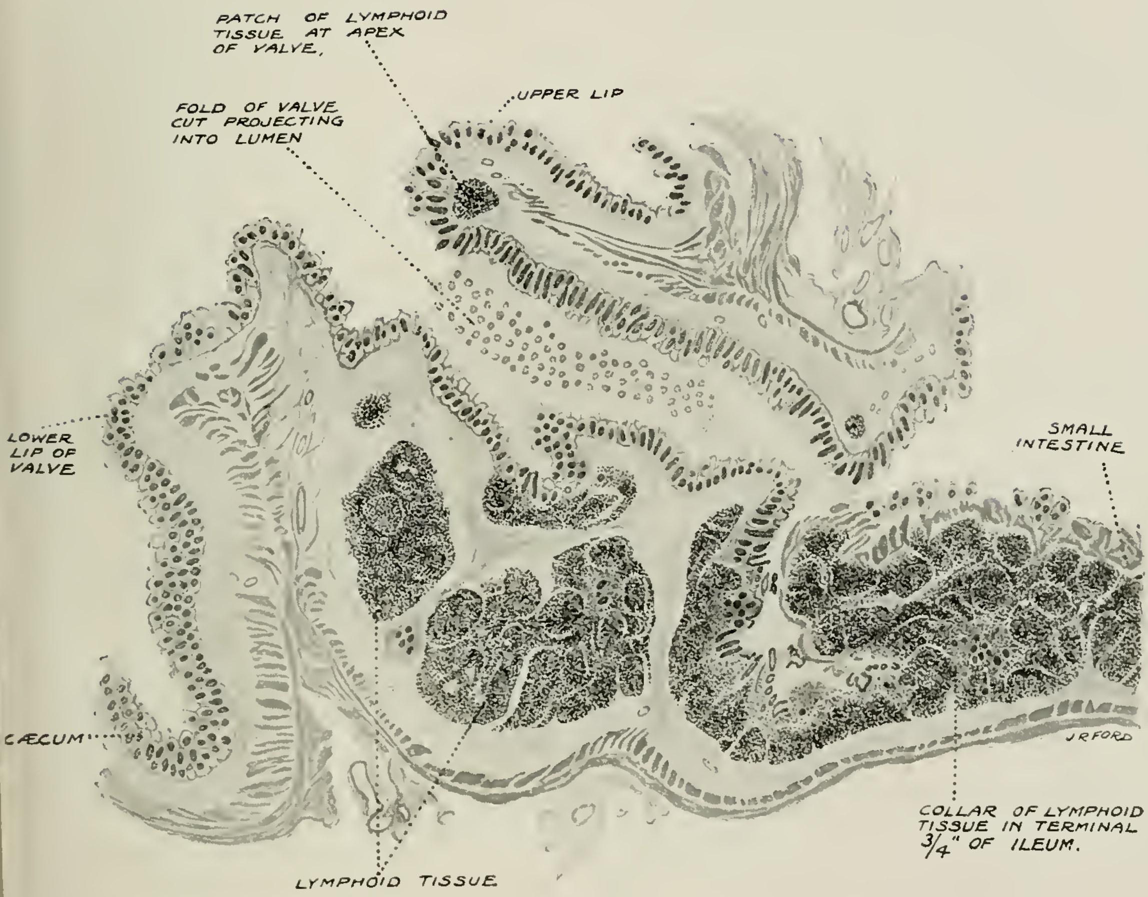
**Intestinal Stasis and Visceroptosis.**—The enormous amount of literature appearing each year upon this subject is largely from the pens of surgical enthusiasts. The 95 per cent of the profession who are utterly opposed to surgery in this field remain silent. I believe that I am not the only one who thinks that the following questions ought to be answered before any surgery in this direction is undertaken :—

1. Is visceroptosis pathological ?—Bryant[25] has made observations on this point in 290 unselected post-mortem examinations. The positive findings would certainly be below and not above the average of living patients in the erect position ; 48 per cent showed moderate degrees of visceroptosis, and 10 per cent showed it in extreme degrees. None had had any symptoms referable to such conditions during life. *Fig.* 35 gives a summary of his findings. In the face of such figures—and those quoted are by no means exceptional—is it not absurd to attribute symptoms of disease to this condition ? "Post hoc ergo propter hoc" has no place in scientific reasoning.

2. Are people with visceroptosis more subject to digestive disturbances than others ?—I know of no proof of this.

# PLATE XXVI.

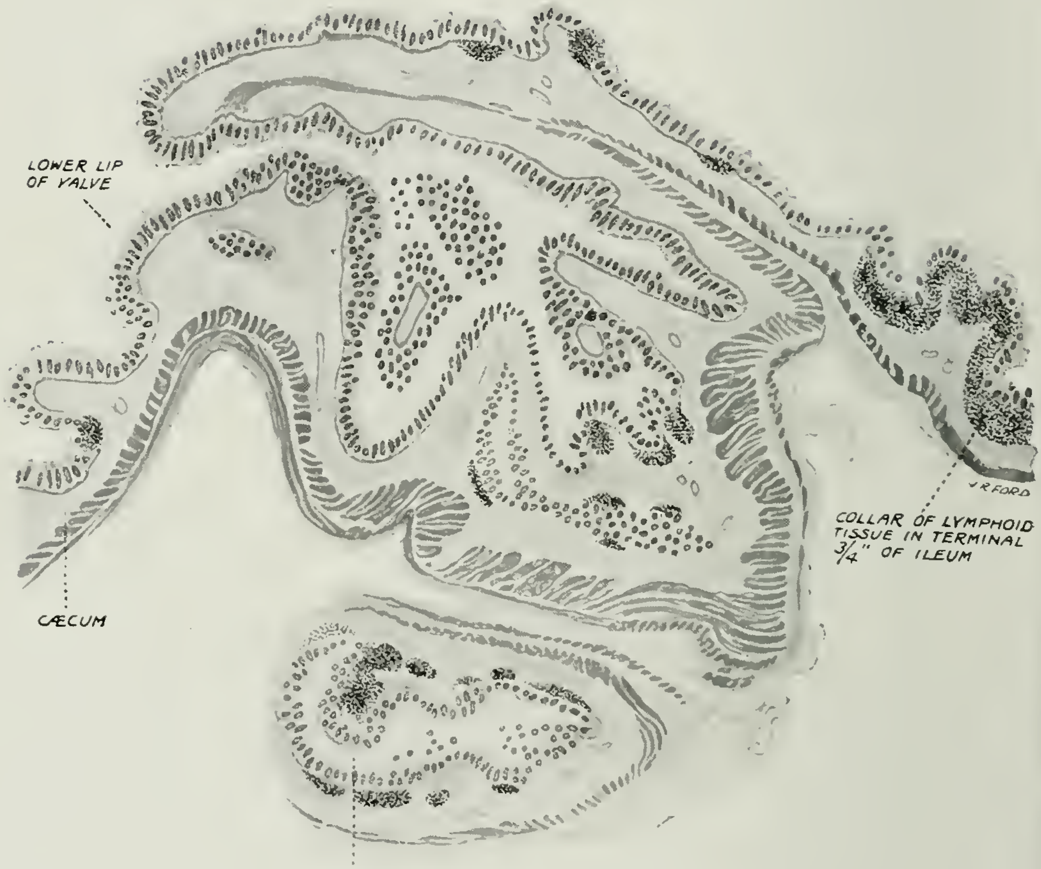
## INTUSSUSCEPTION


PATCH OF LYMPHOID TISSUE AT APEX OF VALVE.
UPPER LIP
FOLD OF VALVE CUT PROJECTING INTO LUMEN
LOWER LIP OF VALVE
SMALL INTESTINE
CÆCUM
J R FORD
COLLAR OF LYMPHOID TISSUE IN TERMINAL 3/4" OF ILEUM.
LYMPHOID TISSUE

Longitudinal section of ileocæcal valve of child, age three months.

*By kind permission of the*
*'British Journal of Surgery'*

## INTUSSUSCEPTION—*continued*



Longitudinal section of ileocæcal valve of child, age one year.

*By kind permission of the*
*'British Journal of Surgery*

3. Does intestinal stasis occur more frequently in persons with ptosis?—This also cannot be answered affirmatively except by inference.

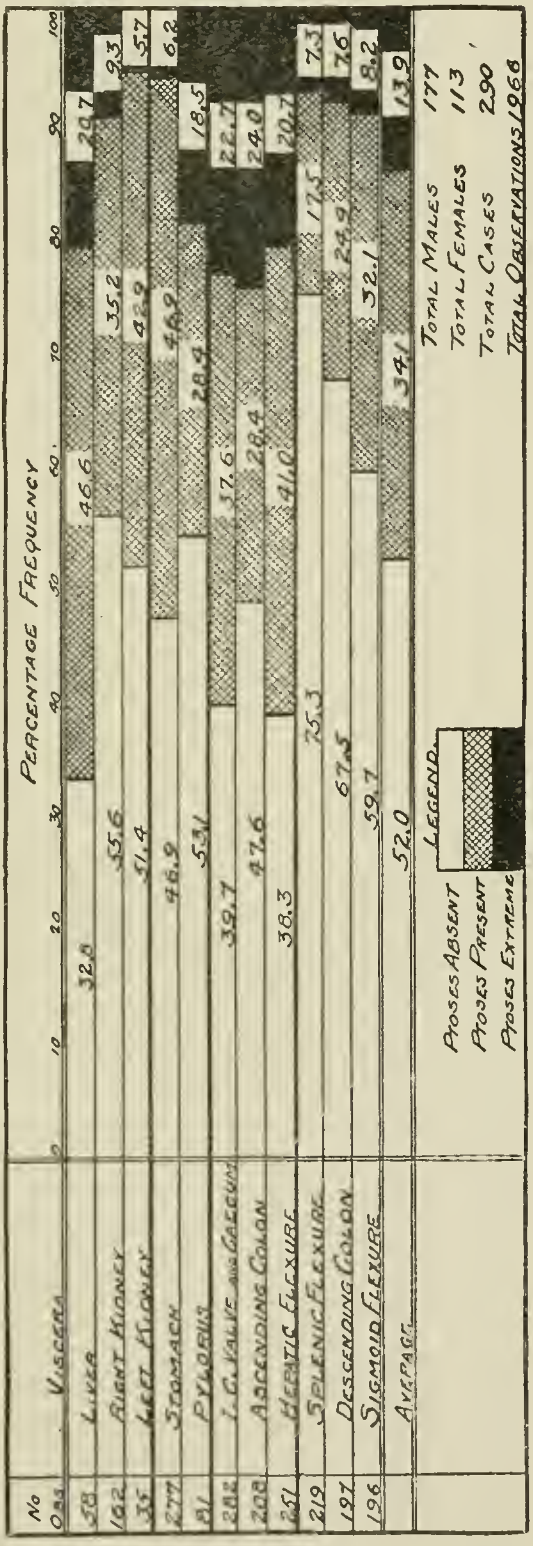


*Fig.* 35.—Pathological findings in visceroptosis.

4. Is intestinal stasis (cæcal or iliac) proved by the fact that radiographs show retained bismuth in these regions?—My answer would be a most decided negative. In the opinion of most internists and gastro-enterologists, the chronic constipation is confined largely to the region of the rectum. Hard masses are found there, but not in the cæcum. The behaviour of a bismuth emulsion and of fæcal material are decidedly different.

5. Should such a stasis exist, is there any proof that absorption of toxins takes place?—Again an unqualified affirmative cannot be given. No conclusive work on this subject has ever been done. As a matter of fact the bacteria-free filtrate of colon contents is not highly toxic. Closed loops of the colon are not incompatible with life. Increase of bacteria in the so-called cases of stasis cannot be proved.

6. Is there any toxæmia at all in such cases?—This, again, cannot be demonstrated by chemical or bacteriological means.

7. If symptoms of depression and pain are noted in patients with this syndrome, are they not due to nervous influence, and are they not the cause rather than the effect of the constipation?—The answer of an enormous number of neurologists would be a decided affirmative.

8. Do colectomy, total or partial, short-circuiting operations, coloplication, etc., do any good in these cases?—Except for a small group of enthusiasts, the answer is most positively 'No'.

Most of the patients submitted to such colonic surgery are not good surgical risks; even the strongest advocates of colectomy recommend it only in a few extreme cases. The operative mortality is therefore high. Lane[26] did 50 colectomies, with 2 deaths. Pauchet[27] quotes

200 colon operations for stasis, with 15 deaths. In the hands of surgeons who have not done special work in this field and developed unusual technique, the mortality would be far higher.

REFERENCES.—[1]*Ann. of Surg.* 1922, April ; [2]*Ibid.* ; [3]*Lancet*, 1922, June 10 ; [4]*Ann. of Surg.* 1921, Nov. ; [5]*Jour. Amer. Med. Assoc.* 1922, Nov. 4 ; [6]*Arch. of Surg.* 1921, iii, 641 ; [8]*Jour. Amer. Med. Assoc.* 1921, July 23 ; [9]*Deut. Zeits. f. Chir.* clxiv, 352 ; [10]*Schweiz. med. Woch.* li, 52 ; [11]*Ibid.* 426 ; [12]*Rev. de Chir.* xxxix, 605 ; [13]*Jour. Amer. Med. Assoc.* 1921, Nov. 5 (abstr.) ; [14]*Boston Med. and Surg. Jour.* 1922, Jan. 26 ; [15]*Brit. Jour. Surg.* 1921, July ; [16]*Jour. Amer. Med. Assoc.* 1921, July, 328 (abstr.) ; [17]*Presse méd.* 1922, April 19 ; [18]*Deut. Zeits. f. Chir.* 1921, Nov. ; [19]*Surg. Gynecol. and Obst.* 1922, May, 375 (abstr.) ; [20]*Zentralbl. f. Chir.* 1922, May 6 ; [21]*Brit. Jour. Surg.* 1921, July ; [22]*Boston Med. and Surg. Jour.* 1922, May 25 ; [23]*Surg. Gynecol. and Obst.* 1921, Nov. ; [24]*Brit. Jour. Surg.* 1922, April ; [25]*Jour. Amer. Med. Assoc.* 1921, Oct. 29 ; [26]*Lancet*, 1922, April 1, 637 ; [27]*Med. Press*, 1922, April 19.

## INTUBATION. (*See* LARYNX, DISEASES OF)

## INTUSSUSCEPTION. (*See* INTESTINES, SURGERY OF.)

## INTUSSUSCEPTION, CHRONIC, IN CHILDREN.

*Frederick Langmead, M.D., F.R.C.P.*

This rare condition differs so much in its symptoms from acute intussusception that it is often wrongly diagnosed and confused, especially with tuberculous peritonitis. G. F. Still[1] makes a valuable contribution to its study by a description of four cases in which intussusception was present for many days or even weeks without producing acute obstruction. As he points out, the condition is overlooked usually because the idea of intussusception is associated with the picture of acute obstruction with bloody stools, and perhaps also because it is not regarded as affecting young children. His cases had their onset respectively at 13 months, 14 months, 23 months, and 3½ years.

He deduces the following composite description from the four cases : " On a particular day the child seemed to have pain in the abdomen and vomited once or twice. During the next few days he vomited occasionally, generally in association with colicky pain. The vomiting has become less frequent—only once in two or three days—and the pain is only occasional. The bowels, which before were open daily, have since the onset been less regular ; aperients have been necessary, but when given have worked well, and the stools have been normal ; there has been no blood in the stool, or at most there has only been a streak once or twice, such as might be seen on the stool of any constipated child. The symptom which has troubled the parents most is *wasting*. The child after three or four weeks of these vague troubles is obviously getting thin. The temperature throughout has been normal." The diagnosis is made by detecting a more or less sausage-shaped tumour, and especially by its varying consistency during palpation. Useful confirmatory evidence may be the appreciation of a sense of unnatural emptiness in the right iliac fossa.

All the cases made rapid and uninterrupted recovery after operation, the duration from onset to operation in each case being as follows : In the infant 13 months old, 32 days ; in the infant 23 months old, 32 days ; in the infant 14 months old, 6 weeks ; and in the child aged 3½ years, 3 weeks. The general health remained good in all except for the wasting.

If abdominal palpation is difficult, Dr. Still prefers examining again when the child is asleep, rather than examining under an anæsthetic. A bismuth meal and *x* rays were used in only one case, and gave no help. The intussusception was ileocæcal in the three infants and ileocolic in the older child of 3½ years. In all there was great swelling and congestion of the wall of the intussuscepted bowel, and in two the long duration had led to fibrous adhesions between bowel and mesentery. Fixation was attempted in none of them, and although the earliest was eight years ago and the latest a year ago, none had recurred.

REFERENCE.—[1]*Clinical Jour.* 1922, Jan. 25, 37.

## JAUNDICE.

*Herbert French, M.D., F.R.C.P.*

*Differentiation of Obstructive Type from Others.*—Professor van den Bergh, of Groningen, in the course of his work on the liver, has evolved the test for bilirubin in the serum which is now known by his name and has been largely made use of. The results are so satisfactory that the method of performing the test is given here, as it is easy to perform and has great clinical value, in that by its means jaundice due to the obstruction of the main bile-ducts by carcinoma, cirrhosis, obstruction in the portal duct, or gall-stones can be distinguished from that due to hæmolysis or functional derangement of the liver cells. This account is taken from an article by McNee[1] in the *British Medical Journal.*

For the test 3 c.c. of serum are required, the blood being taken in the usual way from a vein and the serum separated. The following are required : (1) A few test tubes. (2) Ehrlich's diazo reagent, which should be made in two solutions, that are mixed just before use : *Solution A* : Sulphanilic acid, 1 c.c. ; concentrated HCl, 15 c.c. ; distilled water, 1000 c.c. *Solution B* : Sodium nitrite, 0·5 grm. ; distilled water, 100 c.c. 25 c.c. of *A* are mixed with 0·75 c.c. of *B* to make the reagent. (3) A graduated 1-c.c. pipette. (4) Absolute alcohol (96 per cent). (5) A centrifuge and tubes.

The test is carried out as follows :

To 1 c.c. of the serum 0·25 c.c. of the diazo reagent is added (McNee states that better results are obtained by adding 1 c.c. of the reagent), when one of three events may occur :—

1. *An immediate reaction* (direct).—This begins instantly, and is maximal in 10 to 20 seconds. The colour obtained is a bluish-violet of intensity depending on the amount of bilirubin present.

2. *A delayed reaction.*—This begins only after 1 to 15 minutes or even longer, and consists in the development of a reddish coloration which gradually deepens and becomes more violet.

3. *A biphasic reaction.*—In this a slight reddish colour appears in 10 to 30 seconds, which after a minute or much longer time deepens gradually and becomes more violet.

If the reaction is immediate or direct, an obstructive jaundice is indicated. If a direct or immediate reaction is not obtained to 1 c.c. of serum, add 2 c.c. of 96 per cent alcohol in a centrifuge tube, and centrifuge until all the albuminous precipitate has sunk to the bottom, leaving the supernatant fluid clear. To 1 c.c. of this fluid add 0·25 c.c. of the diazo reagent. A violet-red colour is then obtained if bilirubin be present, which is of maximal intensity almost at once. When no direct reaction has been given, but a perfect indirect reaction, then the jaundice may be inferred to be either hæmolytic in origin or dependent on some functional derangement of the liver cells without obstruction.

The biphasic reaction occurs very seldom, and it is not yet certain what conclusions are to be drawn from it.

By the use of a colorimeter the test may be made a quantitative one, but this is a laboratory process rather than one of general application.

REFERENCE.—[1]*Brit. Med. Jour.* 1922, i, 716.

## JAUNDICE, INFECTIVE.

*J. D. Rolleston, M.D.*

Pathology.—P. Basile[1] inoculated healthy guinea-pigs intraperitoneally with the virus of spirochætosis icterohæmorrhagica contained in the blood aspirated from the heart of infected guinea-pigs. In some cases the inoculation was performed with an emulsion of liver or lung. Most of the animals died within five to seven days after inoculation, but some survived for twenty days. The clinical picture of spirochætosis icterohæmorrhagica in the guinea-pig was not always complete. Jaundice sometimes did not occur, but hæmorrhages were never absent and constituted the principal feature in experimental infection. The most constant and characteristic lesions were found in the lungs and kidneys. The liver was not invariably affected.

Epidemiology.—A. Pettit[2] draws attention to the very unequal distribution of spirochætosis icterohæmorrhagica in the various parts of France, especially during the war. The disease was frequent on the Verdun front, in Flanders, in the neighbourhood of Amiens, and on the Chemin des Dames, but there were very few cases in Champagne or around Belfort. There was apparently not a single case in the mountainous region of the Vosges, although cases were found in the neighbourhood at Nancy and in the plains of Alsace. Pettit admits the possibility of a regional immunity due to a special geological formation, especially as the Japanese observers have established that the diffusion of the *Spirochæta icterohæmorrhagiæ* is related to the reaction of the soil.

Symptoms.—Dargein and Plazy[3] record a case of spirochætosis icterohæmorrhagica in a sailor at Toulon, which was remarkable in the following respects. In the first place, there was no epidemic focus. As the patient had not been out of Toulon for some time, and had been living in a place swarming with rats, the hypothesis of his having been infected elsewhere could be excluded. Secondly, it was impossible to find the *Spirochæta icterohæmorrhagiæ* in the urine in spite of numerous careful examinations, and the nature of the jaundice could only be determined by inoculation of a guinea-pig. The writers insist on the importance of not excluding spirochætosis icterohæmorrhagica on account of the absence of spirochætes in the urine, and maintain that inoculation of a guinea-pig, or failing that the serum test, should be performed.

Commenting on this case, N. Fiessinger and H. Janet[4] record that of a man, age 45, in whose urine spirochætes were found only twice, though in large quantities on both occasions. They maintain that there are two forms of spirochætosis icterohæmorrhagica, in one of which the spirochætes in the urine are abundant and in the other they are scanty. They regard spirochæturia as too inconstant a sign to possess any diagnostic value, and consider the serum test of Martin and Pettit as the most important diagnostic method. (*See* Medical Annual, 1919, p. 214.)

M. Villaret, H. Bénard, and P. Blum,[5] who observed several examples of spirochætosis icterohæmorrhagica in July, August, and September, 1921, record a case in a man, age 53, which was characterized by two remarkable features: (1) The occurrence of two attacks of epistaxis several weeks before the onset of the spirochætosis; (2) The presence of myoclonic movements, which have not hitherto been described in this disease. It was difficult to say whether the epistaxis was a sign of a prolonged incubation stage, or was due to the special soil (alcoholism and syphilis) on which the disease developed. The myoclonic movements were most marked in the forearms, especially the left, and in the lower limbs. After lasting for two days they completely disappeared.

References.—[1]*Policlinico (Sez. med.)*, 1921, 211; [2]*Rev. méd. de l'Est*, 1921, 391; [3]*Bull. Soc. méd. Hôp. de Paris*, 1921, 323; [4]*Ibid.* 396; [5]*Ibid.* 1922, 225.

## JEJUNAL ULCER. (*See* Gastric and Duodenal Ulcer.)

## JOINTS, SURGERY OF. (*See* Bones and Joints, Surgery of.)

## KALA-AZAR. (*See also* Leishmaniasis.)

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

This subject has recently been discussed at the Indian Science Congress, while other important papers have appeared which afford material for a brief review of the present state of our knowledge of the disease.

Etiology.—Our first accurate knowledge concerning the causation of the disease dates from the discoveries of Leishman and Donovan of the parasite in 1903, followed in the succeeding year by its cultivation and the discovery of the flagellate stage by Rogers, leading him to suggest the bed-bug as the carrier of the infection, a view which received strong support soon after by Patton's success in finding the same flagellate stage in the gastro-intestinal canals of bed-bugs fed on kala-azar patients in Madras.

In spite of an immense amount of research work by numerous medical men, the mode of infection of man still remains uncertain, although Patton,[1] in a recent review of the subject, concludes that the establishment of the bed-bug theory is now nearly complete. Other workers, however, dissent from this view, which is based on the following considerations: The parasite may possibly leave the human body either by the alimentary tract or through the agency of a blood-sucking insect. Against the former hypothesis is the absence of proof that the parasites ever escape in the fæces, in spite of Mackie and others having described bodies somewhat resembling the Leishman-Donovan body in intestinal mucus of kala-azar patients in rare cases; but Patton has failed to cultivate the parasite from such mucus even when the blood was swarming with them, while the fact, first pointed out by Rogers, that cultures always rapidly die in the presence of bacteria, is greatly against this mode of infection, which Patton therefore excludes. Of the various possible blood-sucking insects, Patton excludes mosquitoes, fleas, lice, and ticks on various epidemiological and experimental grounds, and he does not think sand-flies can be the carrier in Madras, while Mackie failed to infect 384 sand-flies fed on kala-azar cases, but records finding 10 per cent naturally infected with *Herpetomonas phlebotomi*, and thinks this insect worthy of further attention. Of Indian blood-sucking bugs, Patton excludes *Conorhinus*, as it does not ordinarily feed on man, while in Madras, where Patton worked so long, only the *Cimex hemiptera* occurs, which he used in his successful experiments, in which they were fed on patients with large numbers of parasites in their blood, and flagellates slowly developed in the bug's mid-gut, but disappeared if a fresh feed of blood was given. As the flagellate cannot be regurgitated into the mouth parts, it can only escape by the rectum, and might thus gain entry into the body if the bug were crushed by the patient after biting him. Only a few parasites reached the hind-gut and rectum in the post-flagellate rounded stage, but by cultures they could be demonstrated there up to the thirty-fourth day after a successful feed, even in spite of refeeds of human blood, although in only a small percentage of bugs, which explains why the disease is not more prevalent, notwithstanding that the bed-bug abounds everywhere. As the flagellate development also only takes place between limited temperatures much below blood heat, as Rogers originally showed, the distribution of the disease is limited by climatic conditions. A few years ago Cornwall described a 'thick tail' stage of the flagellate form which only occurs among parasites in contact with intestinal cells of bugs, and not in other insects, and thus is of special significance; while Mrs. Adie, working recently in Shillong, has discovered an intracellular stage of the parasite in bugs of the thick-tail form very similar to the intracellular stage of the *Trypanosoma lewisi* in the mid-gut of the rat flea described by Minchin and Thompson; this marks an important advance, which Patton has confirmed, although Cornwall[2] failed to do so, as it enables the parasite to escape the injurious effects of fresh feeds of blood and eventually to reach the hind-gut and rectum, and so to man if the bug is crushed after biting him, as often occurs, thus completing the life cycle.

Mrs. Adie[3] has also recently found what she believed to be a further stage of the kala-azar parasite in the salivary glands of bed-bugs caught in a kala-azar house, but experts to whom they have been submitted do not consider the bodies to belong to the *Leishmania donovani*, although they differ as to what organism it is.

Although Patton is satisfied that the bug is the insect-carrier of the infection, Mackie[4] thinks this is not yet proved, and suspects the sand-fly as a possible carrier, while other workers, including the writer of a leading article on the problem in the *Indian Medical Gazette*,[5] also regard the question as still an open one, requiring combined work of a commission of experts for its solution.

Diagnosis.—Now that we have in antimony a specific curative treatment, the correct diagnosis of kala-azar is of the utmost importance, because definite assurance is essential before commencing the long course of injections necessary to prevent relapses, which may be much less amenable to the drug than the untreated cases. Cultures of the parasite from the peripheral blood have been advocated during the last few years for this purpose in order to avoid the possible dangers of spleen puncture, J. W. Cornwall and H. M. Lafrenais[6] advising the distribution of 5 c.c. of blood in 20 N.N.N. culture tubes incubated at 17° to 20° C., a difficult temperature to obtain in the hot and rainy seasons in many parts of India, for 15 to 21 days. B. M. D. Gupta[7] obtained positive results by culture in 33 of 35 cases, the two negative ones having had a long course of antimony, while T. S. Ayyar and K. V. Krishnan only got positive results in 25 per cent of 40 cases, one only on the fortieth day; Knowles in Shillong also had very disappointing results by this method, the long delay in the result being also a great drawback. Elves[8] advocates liver puncture in preference to spleen puncture as being quite safe and yielding 80 per cent positive results, while in the negative ones he follows it by spleen puncture, as further positive results are thus obtained. Knowles, Dodds Price, and Muir, on the other hand, have performed many hundred spleen punctures without any harm resulting. The latter and Napier[9] advise 30 gr. of calcium lactate on the morning of the puncture, and if possible also on the previous evening, fixing the lower border of the spleen by an assistant and pressure for half an hour after as precautionary methods: in this manner spleen puncture is a most reliable, safe, and rapid proceeding available under ordinary conditions in the absence of laboratory facilities.

Treatment.—The success of the treatment of kala-azar by intravenous injection of **Potassium** or **Sodium Antimony Tartrate** is now well established; but there are still great difficulties in saying when a given patient is completely cured and safe from relapse on discontinuing the drug, and consequently some difference of opinion exists as to the doses and duration of the treatment, as well as regarding the most efficient form of antimony and the best method of administration. Rogers reported the sodium salt to be slightly less toxic and more efficient than the potassium one, and also recorded good results with **Colloid Antimony Sulphide**; but Napier prefers the potassium salt, so there is probably little difference between them, although others do not appear to have had good results with the colloid preparations, which thus seem to be uncertain. (In India stibenyl has been found by P. Gunguli[10] and by Napier to be too toxic for use.) Of greater importance is the duration of the treatment, which Napier[9] advises should begin with 1 c.c. of a 1 per cent solution and be increased by 1 c.c. three times a week to 10 c.c. in adults, and half these doses for children up to ten years, the next dose not being increased after any toxic signs appear, while the duration should be four months, according to Muir, and up to a total of 2 grm. in Knowles' experience. Napier also gives up to 2 grm., carrying it on to 3 grm. where there is any delay in the fall of the temperature, which should reach the normal after three or four weeks. Napier states that should a relapse occur it will always again respond to treatment; but Elves[8] mentions cases in which this was not the case and relapses proved fatal, apparently due to antimony-fast parasites having developed; so it is well to be on the safe side. It is not necessary to continue until a very large spleen has completely subsided, but the leucocytes should have risen to the normal or above it, and the weight and strength have greatly increased, before treatment is left off. Napier advises **Digitalis** and **Nux Vomica** to raise the blood-pressure, while Muir's subcutaneous injections of **Turpentine** are also valuable for increasing the leucocytes.

Napier[11] also reports interesting observations on the varying amounts of impurities in different preparations of antimony salts. He found that a pure preparation specially made for intravenous injection produced only slight and very temporary pain on intramuscular injection, and he has used this method in cases unsuitable for intravenous injections on account of small veins, etc., chiefly in children, with very favourable results. A 2 per cent solution of the scale preparation of sodium antimony tartrate in distilled water was injected into the buttock in doses of from 0·5 to 2 c.c., up to 1-c.c. doses daily and the 2-c.c. ones on alternate days. Abscesses occurred in only 2 per cent of the injections, and at the time of reporting, after only four months, 8 of 11 cases showed strong evidence of being permanently freed from the disease; so, if further experience confirms these important observations, the method of treatment will be greatly simplified and rendered more generally available. At the present time several thousand cases of kala-azar are being treated in Assam with antimony salts intravenously, with every prospect of enabling this dread disease to be largely, if not completely, stamped out, as Muir had already done for a number of miles round his hospital at Kulna, in the Burdwan district of Bengal. It is not, therefore, too much to say that with the simpler form of treatment the disease could be eradicated from civilized countries with efficient medical departments.

A curious result of apparently insufficient treatment has been reported by U. N. Brahmachari,[12] who has met with four cases in which, some time after antimony treatment for kala-azar, with apparent recovery, a number of small nodules somewhat resembling tubercular leprosy in appearance, but containing numerous Leishman-Donovan bodies, have appeared in the skin of the face, body, and extremities, quite unaccompanied by any febrile or other symptoms of active kala-azar. He thinks this is evidence of the identity of kala-azar and dermal leishmaniasis; but J. W. D. Megaw[13] differs from this conclusion, while Patton[1] gives strong grounds for differentiating the parasites of the general and dermal forms of leishmaniasis. It is not yet known whether these peculiar cases will prove amenable to further antimony treatment or not, but their occurrence is a strong argument for continuing the treatment long enough to be practically certain all the parasites have been completely destroyed.

[I would suggest a trial of tartar emetic by the rectum in kala-azar in both children and adults in view of the success in bilharziasis reported by H. F. Wilson. See article on that disease in this year's MEDICAL ANNUAL.—L. R.]

REFERENCES.—[1]*Ind. Jour. Med. Research*, 1922, Jan., 496; [2]*Ibid.* 545; [3]*Ibid.* v.; [4]*Ind. Med. Gaz.* 1922, 217; [5]*Ibid.* 221; [6]*Ibid.* 216; [7]*Ibid.* 217; [8]*Ibid.* 217; [9]*Ibid.* 1921, 401; [10]*Ibid.* 1922, 218; [11]*Ibid.* 10; [12]*Ibid.* 125; [13]*Ibid.* 128.

## KERATODERMIA BLENNORRHAGICA. *E. Graham Little, M.D., F.R.C.P.*

Gager[1] reports a remarkably extensive eruption of papulopustular lesions with arthritis of wrists and knees, and an active urethral discharge, with a history of six previous attacks of gonorrhœa. The patient, a man of 41, had general glandular enlargements and considerable fever and wasting. Gonococci do not seem to have been sought for in the urethral discharge or in the skin lesions, and treatment did not include administration of vaccine, which has seemed to act well in many cases. The treatment adopted is not described. Convalescence was very slow, and the arthritis persisted for more than six months.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1921, April 1, 941.

## KIDNEY FUNCTION TESTS. *John D. Comrie, M.D., F.R.C.P.*

The examination of the kidneys as regards general functional power, apart from, or rather in addition to, a consideration of their state from the point of view of morbid anatomy and histology, appears now to have been definitely and generally accepted as a routine clinical procedure. The requirements in surgical and medical cases differ somewhat, and so, naturally, tests which gain the approval of the surgeon and physician may differ. For the surgeon the question usually is whether the efficiency, in a case where the kidneys are not healthy, is sufficiently high to carry the patient through a serious operation; while the physician desires guidance of a quantitative nature in the immediate, and especially the later, prognosis. Many tests have been proposed, tried, and dropped, and there has been a considerable amount of critical work on the half-dozen or thereabout that meet with general acceptance, various workers having preferences for different tests.

*Albuminuria.*—There is still considerable divergence of opinion as to the relative seriousness of the presence of albumin in the urine apart from other signs of kidney disease. On the one hand, Dublin,[1] basing his conclusions on the after-history of 5000 persons rejected for Life Insurance who had had persistent albuminuria, even of the 'trace' variety, found they showed a greater than normal mortality from other diseases, e.g.: cancer, twice that found among average insured; diabetes, three times; tuberculosis, over three times; apoplexy and cerebral hæmorrhage, four times; and chronic interstitial nephritis, twelve times. With special regard to renal damage, on the other hand, Maclean[2] (*see also* MEDICAL ANNUAL, 1920, p. 244) found albuminuria of renal origin in 5 per cent of soldiers, and presumes its existence to that extent in the whole adult male population; he considers that this does not incapacitate these individuals, nor render them more liable than individuals with normal urine to suffer from subsequent nephritis.

*Water Excretion.*—This was considered in the MEDICAL ANNUAL, 1922, p. 234. The test, which originally consisted in the collection of 24 hours' urine by seven 2-hourly day specimens and one 10-hourly night specimen, is theoretically extremely simple. Practically, however, it is irksome, and Jones[3] proposes a modification for the sake of simplicity, collecting the day urine in one sample from 8 a.m. to 8 p.m. and the night urine in one sample from 8 p.m. to 8 a.m. The fluid intake is normally fixed at 1800 c.c., including that at meals, and the last meal for the day is taken at 5 p.m. He finds, however, that it makes no difference to the result whether the amount of fluid intake be 1000, 1800, 3000, 4000, or 5000 c.c. In healthy persons the proportion of day to night amount is $1 : \frac{1}{4}$ or $1 : \frac{1}{3}$, occasionally $1 : \frac{1}{2}$. In chronic contracted kidney the normal ratio is often reversed, the night amount being greater than that of the day; but on a protein-free diet with clinical improvement, the normal ratio is in many cases re-established.

Along with this test Jones[1] recommends the specific gravity fixation test and the phthalein test. Sharlit and Lyle[5] recommend the performance of the specific gravity fixation test by estimating the ratio between the quantity of solids eliminated from 8 a.m. to 8 p.m. (day solids) and that of solids eliminated from 8 p.m. to 8 a.m. (night solids). This is estimated simply by multiplying the specific gravity in each case by the volume of the day or night urine as the case may be. The proportion

sp. gr. × vol. (of day specimen) : sp. gr. × vol. (of night specimen)

is represented by a factor which in normal persons he has found to vary from about 1·6 to 2·5 or more, and in nephritic cases from about 0·6 to 1·3.

Richards[6] records some elaborate experiments on the kidney (frog), in which he saw the glomeruli at work under the microscope. These throw considerable light on the subject of varying water secretion. He states that there is a kind of alternation of work between different areas of the kidney, the circulation slowing or stopping temporarily in one set of glomeruli and speeding up in others adjacent. His researches tend to show that increased blood-pressure in the kidney increases urine formation.

Researches of a chemical nature by Powell White[7] tend to show that some substances (sodium, potassium, chlorine) are excreted in connection with water; others (urea, uric acid, sulphates) are excreted independently of water.

*Blood-Urea and Urinary-Urea Concentration Tests.*—These retain their place in favour with those who have used them. In a discussion at a meeting of the Bristol Medico-Chirurgical Society, Clarke and Symes[8] preferred the combination of the fixation of specific gravity test, the urea concentration test, and the estimation of blood urea. Black[9] finds the specific gravity fixation and urea concentration tests of great value, though there is not an absolute parallelism between them. Harrison,[10] on the basis of 400 cases, found the urea concentration test useful, and recommends a combination of this test and the blood-urea estimation. Maclean[11] recommends the combination of the blood-urea test, urea concentration test, and the urea concentration factor. The last is the figure obtained by dividing the number of mgrm. of urea in 100 c.c. of urine by the number of mgrm. of urea in 100 c.c. of blood. The normal figure for the factor is 60 to 80, and Maclean states that when the factor is about 40 the outlook for any surgical operation is poor, and with a factor of 20 almost hopeless. When the factor gets in the region of 2 or 3, life cannot be long sustained. As the urea concentration factor gives no new information, but merely expresses the relation of urinary urea to blood urea, it seems simpler to discard it and state the figures for urinary-urea and blood-urea separately. Maclean[12] further emphasized the importance of these tests in the discussion on "Prognosis and Treatment of Chronic Renal Disease" at the British Medical Association Meeting, 1922. It is often noticed that the urea administered for the urea concentration test, in addition to stimulating a concentration of urea in the urine, provokes a watery diuresis; this is most noticeable in the first-hour sample, but it sometimes extends into the second hour and so interferes with the test by giving a lower reading. It is usual, if the amount of urine in the second hour is much over 150 c.c. (the normal amount), to discard the test and do it again later. Comrie[13] points out that allowance may be made for this hydrodynamic response of the kidney by employing the formula $C = U \times \frac{Q}{150}$, where C is the concentration sought in terms of a normal amount of water, Q the actual quantity passed, and U the percentage of urea found in this. For example, if the patient were to pass an excess amounting to 250 c.c. in the second hour and this contained 2 per cent of urea, then $c = 2 \times \frac{250}{150} = 3{\cdot}3$ per cent, i.e., the figure to which the kidneys had concentrated urea apart from the watery diuresis.

Rabinowitch[14] regards the urea concentration test and night-urine test as 'qualitative' only, and not reliable as an index of improvement or deterioration, and finds better indications from the phenolphthalein excretion.

Nyiri[15] records his satisfactory results in estimating blood-urea by the use of the Ambard-Hallion ureometer, in which bromine solution is used and the results can be read off in ten minutes. The objection to this method lies in the large amount of blood required (over 10 c.c. of serum).

*Phenolsulphonephthalein Test.*—The way in which this and other dyes, like indigo-carmine, are used by surgeons differs from their employment and the information desired from them by physicians. With regard to surgery, Schwarz[16] points out that the majority of German surgeons have been fully satisfied with the phloridzin and indigo-carmine test findings. Everidge[17] considers that the phthalein test gives fallacious readings in about 15 per cent of cases, and prefers the urea-concentration test, which, if it does not reach 1·5 per cent, contra-indicates prostatectomy in his opinion. Macalpine[18] considers that the phthalein test gives earlier indications of renal degeneration than the urea concentration, and the fact is pointed out by other writers that being a more delicate test it is more suited for the purposes of the physician.

Kidd[19] points out, as a proof of the value of these tests, that in the few years since they have been adopted by urinary surgeons the general mortality of nephrectomy has fallen from 40 per cent at the end of last century to less than 2 per cent, and that of prostatectomy from 30 per cent to less than 5 per cent; he gives the first place to a 'dye' test, but prefers indigo-carmine to phthalein, and he uses it according to time of first appearance, not according to the quantity excreted. Swan and Thomson-Walker[20] also express approval of indigo-carmine used in this way in combination with cystoscopy for surgical purposes.

In America the phthalein test is generally held in the highest estimation. Piersol[21] commends it in combination with the fixation of specific gravity test. Patterson and Jones[22] also regard it as the best test, both as regards availability and reliability. Comrie[23] considers that the best combination of tests is afforded by the phthalein test, the blood-urea test, and the urea concentration test.

Some points in technique are worthy of note. Snowden[24] calls attention to the fact that retardation of the phthalein excretion is the earliest indication of functional disability of the kidney, and also that in cases of marked functional impairment the excretion of phthalein is increased by giving water to drink. Burwell and Jones[25] have devised a method for the removal of bile and blood from urine in which they are present and cause difficulty in obtaining a correct colorimeter reading. Their method is to add to a portion of the urine, after it has been diluted, an equal bulk of a saturated alcoholic solution of zinc acetate, which precipitates bile pigments and hæmoglobin; thereafter the precipitate is removed by filtration, and allowance made in the final calculation for the dilution.

*Diastase Test.*—This test has fallen largely into disuse. Maclean,[26] who was one of the first to use it extensively, states that he has seen many patients, in whom the kidneys were markedly involved, where the diastatic value was normal or above normal; and at a later date,[27] "the test is useful, but too erratic to be of much value by itself".

Chandler[28] records a case of persistent albuminuria in which the chemical pathologist reported that the diastase test was normal, and yet in a month the patient was dead of uræmia! Hadfield[29] has never known the test to give any help in judging kidney efficiency, and Harrison[30] considers that it is dependent on a number of non-renal factors, and would only give evidence of renal inefficiency when the inefficiency was so far obvious as to make tests superfluous.

*Newer Tests.*—The *hippuric acid* synthesis test of Violle was described in the Medical Annual, 1922, p. 236. His further experience has tended to confirm its reliability,[31] and he regards changes in the formation of hippuric acid as the reflection of more stable functional disturbances than the fluctuations of albuminuria or uræmia. Kingsbury and Swanson[32] modify this test by giving 2·4 grm. of sodium benzoate by the mouth, and estimating the amount of hippuric acid passed in the next three hours; this amounts to almost the whole equivalent amount in normal persons, while in nephritics they have not found it rise above 50 per cent.

The estimation of *creatinine* excess in the blood has been recommended instead of blood-urea estimation, but Patterson and Jones[33] do not find this reliable, for several of their particularly severe nephritic cases showed blood-creatinine at about 2 mgrm. per 100 c.c., and of three fatal cases only one gave a value above 2·5 mgrm.—the amount at which the normal creatinine is placed by some investigators.

Wallis[34] has proposed a test depending on the fact, which he states he has discovered, that normally the blood and urine contain the same amount of sugar, while in renal disease the blood might contain three times as much sugar as the urine.

Linder[35] proposes to readopt *potassium iodide* excretion (which was suggested by Dyce Duckworth in 1867) as a test for renal function. He found that normal persons within twelve hours excrete 45 per cent or more of the dose of iodide given; that patients who excrete over 35 per cent have a good prognosis; that those who excrete less than 15 per cent have clinical signs of severe renal damage; and that the worst cases who die of uræmia excrete only 10 or 5 per cent, or none at all.

Kummer[36] draws attention to the fact that there exists normally a kind of rhythmic alternation between excretion of urea and excretion of chloride, and that from day to day the one rises to a maximum as the other falls to a minimum. In nephritic cases this balance does not occur. He investigated 23 cases of prostatectomy, which included 15 cases with normal excretory rhythm, of whom none died, and 8 cases with pathological rhythm, of whom 7 died.

Marin[37] recommends the test of Jolles for *hyperindicanæmia* as a sign of true nephritis when albuminuria is present.

References.—[1]*Amer. Jour. Hygiene*, 1921, May, 310 (abstr. in *Jour. Amer. Med. Assoc.* 1921, Dec., 2122); [2]*Med. Press*, 1921, Sept., 233; [3]*Jour. Amer. Med. Assoc.* 1922, Feb., 477; [4]*N.Y. Med. Jour.* 1922, May, 531; [5]*Arch. of Internal. Med.* 1921, Nov., 649; [6]*Amer. Jour. Med. Sci.* 1922, Jan., 1; [7]*Lancet*, 1922, i, 369; [8]*Bristol Med.-Chir. Jour.* 1922, June, 13; [9]*Amer. Jour. Med. Sci.* 1922, Feb., 218; [10]*Brit. Jour. Exper. Pathol.* 1922, Feb., 3 (abstr. in *Jour. Amer. Med. Assoc.* 1922, April, 1163); [11]*Lancet*, 1921, ii, 1161; [12]*Brit. Med. Jour.* 1922, ii, 1067; [13]*Ibid.* 1072; [14]*Arch. of Internal Med.* 1921, Oct., 827; [15]*Wien. klin. Woch.* 1922, Jan., 83; [16]*Zeits. f. urol. Chir.* 1921, July, 7 (abstr. in *Jour. Amer. Med. Assoc.* 1921, Sept., 979); [17]*Lancet*, 1921, ii, 1161; [18]*Ibid.* 1163; [19]*Ibid.* 1922, i, 788; [20]*Ibid.* 893; [21]*N.Y. Med. Jour.* 1922, Jan., 9; [22]*Therap. Gaz.* 1921, July, 467; [23]*Brit. Med. Jour.* 1922, ii, 1071; [24]*Arch. of Internal Med.* 1921, Nov., 603; [25]*Jour. Amer. Med. Assoc.* 1921, Aug., 462; [26]*Brit. Med. Jour.* 1921, ii, 426; [27]*Ibid.* 1922, ii, 1069; [28]*Practitioner*, 1921, July, 33; [29]*Bristol. Med.-Chir. Jour.* 1922, June, 13; [30]*Lancet*, 1922, i, 894; [31]*Ann. de Méd.* 1921, May, 330 (abstr. in *Jour. Amer. Med. Assoc.* 1921, July, 407); [32]*Arch. of Internal Med.* 1921, Aug., 220; [33]*Therap. Gaz.* 1921, July, 467; [34]*Lancet*, 1921, ii, 1164; [35]*Quart. Jour. Med.* 1922, April, 227; [36]*Presse méd.* 1921, July, 603; [37]*Policlinico*, 1922, April, 222.

## KIDNEY, SURGERY OF.

*Sir John Thomson-Walker, F.R.C.S.*

### PYELOGRAPHY AND PNEUMOPERITONEUM.

Merritt[1] discusses the toxicity of sodium bromide in comparison with that of other pyelographic media. The intravenous injection of sodium bromide produced practically no effect, even when as much as 55 c.c. were given; 2 to 3 c.c. of potassium iodide was almost immediately fatal, while 50 c.c. of sodium iodide caused a slight reaction from which recovery was rapid. The toxicity of thorium nitrate seemed to vary with the age of the solution; several deaths occurred shortly after its introduction, possibly, it was thought, as the result of a direct toxic effect on the heart. Merritt concludes, as the result of his own experience, that sodium bromide is not toxic, is little if at all irritating in 20 per cent solution, is readily procurable, is cheap, and easy to prepare, as it can be sterilized by boiling prior to use, and gives a clearly outlined shadow. Sodium iodide is the next best medium, whereas potassium iodide and thorium nitrate have a high toxicity, and the use of these media is not to be encouraged.

Papin[2] draws attention to the importance of pyelography in urological practice. The accidents which formerly attended it were due to bad technique, and can be avoided if the greatest gentleness is used in ureteral catheterization and the introduction of the pyelographic medium. He advocates the use of small catheters, permitting the escape of fluid from the renal pelvis alongside the catheter, and deprecates the use of syringe-pressure. He prefers to use a crystalloid solution, notably sodium bromide (30 per cent). The method is most useful in the diagnosis of hydronephrosis, although it is also of service in the investigation of mobile kidney, and abnormalities of, and calculi in, the kidney and ureter; in certain cases of renal tuberculosis and renal tumour it facilitates diagnosis and renders it more precise.

Young and Waters[3] state that accidents following on the use of collargol in pyelography are shown experimentally to have been due to too great syringe-pressure driving the collargol up the tubules and into the glomeruli, and infiltrating the interstitial tissue beneath the renal capsule. In some cases it passed into the general circulation, producing lesions in distant organs, and occasionally causing death. From their own experience, based on some hundreds of cases, they consider that sodium bromide and thorium nitrate are almost ideal media, the former being easier and less costly to prepare.

Lowsley[4] states that sodium iodide and sodium bromide gave the most satisfactory pyelographic pictures with the least amount of irritation, and of these two he found the former to be the more satisfactory. Specimens of urine are taken from each kidney and a renal function test (phenolsulphonepthalein) is performed, after which two pictures are taken, one of the kidneys and upper ureters, the other of the bladder and lower ureters, before an opaque substance is introduced. If stone in the ureter is suspected, a double-exposure plate is taken, in which a stone in the ureter will be in apposition to the lead catheter; then the $x$-ray tube is moved laterally, when it will be seen that the shadow due to a stone in the ureter moves with the catheter. If the shadow is cast by an object above or behind the ureter, it will not be in exact apposition to the catheter in the second picture owing to the change in angle. The opaque material is now introduced under gentle pressure on each side until the patient states that a sense of fullness is felt in the back. Pictures are taken immediately, both of the kidneys and upper ureters, and of the bladder and lower ureters. The patient then sits up, with a plate so placed that its middle is at the level of the crest of the ilium, and thus the kidney, ureter, and a portion of the bladder are included. The lead catheters are slowly withdrawn, sodium iodide being injected the while. When the tip of the catheter lies just within the ureteric orifice, a picture is taken to show any abnormality in the calibre of the ureter or in the position of the kidney. The catheters are reintroduced a slight distance and the sodium iodide is drained off. The catheters and cystoscope are then removed. In a series of 500 pyelographies, in only 7 cases was there pyrexia above 100° F. following this procedure.

Kidd[5] discusses pyelography, and emphasizes the importance of having the radiographic apparatus so arranged that the picture can be taken on the same table as that on which the manipulations for filling the pelvis are performed, and as soon as the medium has been introduced. He prefers the film to be placed underneath the patient's back, using an Albers-Schoenberg compressor, diaphragm, and air pad, with the tube above. He uses a double intensifying screen and duplitized films, and endeavours to take as short an exposure as possible. A warmed, sterilized 20 per cent solution of sodium bromide is introduced by syringe-pressure. The medium is removed from the renal pelvis after a picture has been taken.

Stern and Ritter[6] describe a new technique for pyelography. A 20-c.c. ampoule of sodium iodide solution is opened, and a two-hole cystoscopic cap is applied. Through one opening in this cap the ureteric catheter from the patient is inserted, and through the other a short length of discarded ureteric catheter, extending to the bottom of the ampoule, which is then inverted. To the free end of the portion of catheter, a 20-c.c. Luer syringe, filled with air, is applied, by means of which the ampoule can be emptied into the renal pelvis.

Sante,[7] in a paper on *pneumoperitoneum* as an aid in the $x$-ray diagnosis of lesions of the urinary tract, states that those of his cases in which pneumoperitoneum has been of distinct advantage fall into three groups :—

1. Cases in which the presence, position, size, shape, mobility, and attachments of a kidney are to be determined, especially when, for any reason, cystoscopy is impossible or unwise. Any distinct variation in the size and in the outline can be readily detected, e.g., in tuberculosis with destruction of the kidney substance, or where small carcinomatous nodules stud the surface but are too small to make definite palpable masses. Congenital cystic kidney has been differentiated from surrounding pathological conditions, e.g., carcinoma of the descending colon.

2. Cases in which the origin and attachments of intra-abdominal masses arising in connection with the liver, the gall-bladder, the appendix, the pancreas, the uterus, the bowel, etc., are doubtful. The mere establishment of the identity of a palpable mass as a displaced but otherwise normal organ may be sufficient to clear up an obscure diagnosis. The retroperitoneal character of an abdominal mass can be determined by placing the patient in the 'retroperitoneal' position, i.e., the patient, previously somewhat overflated, is placed in the prone position with the chest and thighs supported by two blocks, taking all pressure off the abdomen and allowing the anterior abdominal wall to sag freely forward. All viscera with a mesenteric attachment fall forward ; thus a prevertebral clear space is produced which renders the presence of any retroperitoneal mass readily visible, and shows the relationship of such to the kidney or other organs.

3. Cases of conditions peculiar to the urinary tract. Examinations of the kidneys for stone should be undertaken only as a last resort. The differentiation between renal and biliary calculi becomes quite a simple matter. In combination with the injection of pyelographic media, unless the patient is very stout, the filling and the emptying of the renal pelvis and the ureter can be observed. For studying the renal pelvis, the lateral view is sufficient ; but for the ureter, the retroperitoneal position is best. For examination of the

bladder the method is of greatest value in determining its relationship to pelvic masses, for the presence of bladder tumour, and for observation of the elasticity of the bladder-wall. Diverticula do not show well except when quite large. Demonstration of the prostate is no better by this method than simple inflation of the bladder.

The author states that his use of the method is limited to about 110 cases, but he considers that with more experience other conditions will be found in which this procedure will be of value. His technique is as follows: After thorough evacuation of the bowels and bladder, $\frac{1}{6}$ gr. morphia is given, the left lower quadrant of the abdomen is painted with iodine, and a lumbar-puncture needle is inserted, passing slightly upwards and inwards. The pump of a Potain aspirator is connected by tubing to the needle with a rectal drip interposed as a trap (vent-hole plugged) to prevent the introduction of foreign material from the pump. Everything is sterilized but the pump. As a criterion of proper distention he takes the slight rounding of the abdomen, the development of a tympanitic note, and the appearance before a fluorescent screen. He uses air, or a mixture of oxygen and carbon dioxide, and at the conclusion of the examination he deflates by the introduction of another needle.

Carelli[8] describes a method of observing the kidney without pneumoperitoneum by the production of an artificial emphysema in the surrounding cellulo-adipose tissue, which is done as follows: An *x* ray having been taken after placing metallic landmarks on the skin, a fine platinum needle 10 to 12 cm. long is inserted under strict asepsis down to the transverse process of the second lumbar vertebra. Having reached this process, the course of the needle is deviated so as to avoid it. Oscillation of the manometer of the injecting apparatus indicates the arrival of the needle in the perirenal fat. Carbon dioxide from 200 to 600 c.c. is now injected. Absorption is so rapid that, if several photos are wanted, they must be taken as soon as the emphysema is produced and as rapidly as possible.

Hernaman-Johnson,[9] describing the Carelli method, considers the essential points of the technique to be: (1) The use of a fine needle. (2) Accurate location of the transverse process of the second lumbar vertebra by tracing the last rib to its junction with the spine, and taking a point 2 cm. below its angle and 2 cm. from the middle line, and then counting the spinous processes upwards from the fourth lumbar and taking a point midway between the second and first as giving the required level. (3) Proper direction, i.e., slightly forward and a little outward, of the needle after it has struck the process. (4) Use of the needle open so long as it is being advanced, to permit detection of punctured blood-vessels. (5) Sound judgement as to the depth of insertion. (6) Determination of the entrance of the needle point into the perirenal tissue by manometer readings, i.e., movement of the column of fluid upwards with inspiration and downwards with expiration. (7) Slow injection of the gas, $CO_2$ or oxygen. (8) The quantity of gas injected not to exceed 500 c.c.

## SURGICAL TREATMENT OF NEPHRITIS.

Rovsing[10] discusses the surgical treatment of chronic nephritis upon 77 cases on which he has operated. He considers that definite benefit is to be derived from slitting and loosening the renal capsule in selected cases. His first operation was in 1892, for intense pain thought to be due to calculus. The renal capsule was slit and stripped up, releasing an accumulation of blood on the surface of a chronically diseased kidney. He quotes the case of a young man with chronic tubular nephritis unrelieved by eight months' hospital treatment. He decapsulated first one kidney and then the other, with the result that the œdema and the albuminuria disappeared, and the patient has since become apparently perfectly well. In other even more severe cases the result has been similar; in one there has been an interval of eleven years with no sign of further disturbance. He also reports some remarkably favourable experiences with cases of advanced contracted kidney, the blood-pressure falling, and the process being apparently arrested by operation. In one case, a woman of 44, there has been for three years no return of a formerly frequently recurring hæmaturia. He does not resect the capsule, and always takes a slip of kidney tissue at operation, and a specimen of urine from each kidney before and after operation, for investigation.

The only cases in which no benefit was apparent in this series were two of unilateral hæmorrhagic parenchymatous nephritis, of which one was cured by a subsequent nephrectomy, and the other, he thinks, could have been. In 3 cases of glomerular nephritis, the 2 unilateral ones were cured by nephrolysis, but the bilateral one was only improved. Of 26 cases of interstitial nephritis, and perinephritis, with attacks of pain and hæmaturia, but with no albuminuria between these attacks, he claims that all were cured, and considers that they were probably toxæmic in origin. Of 32 such cases with albuminuria, 19 were cured, which appeared to be similarly of toxic origin, whereas those that showed only more or less improvement were of the contracted kidney type. In conclusion, he states that chronic nephritis is unilateral more often than is supposed.

Rubritius,[11] in discussing the surgical treatment of nephritis, agrees with those who think that the evil consequences sometimes observed after nephrotomy are due to lack of care in restoring the kidney to its bed. To obviate these he suggests a nephropexy, except when there has been suppuration, and hence danger of adhesions. If the ureter becomes plugged with clot, urine will accumulate, wash off the thrombi, and start a hæmorrhage. Surgical treatment of nephritis is indicated in certain forms of acute nephritis, in the anuria of mercuric poisoning, in nephritis with abscess formation, in intractable and severe hæmorrhage in one kidney, in cases of unbearable pain, and in chronic nephritis with anuria and uræmia, especially the cases without œdema, in which prognosis is least favourable.

[Much difficulty in estimating the results of decapsulation and nephrotomy in aseptic or medical nephritis has arisen by the grouping together of all forms of nephritis—chemical, aseptic, septic, and mechanical. This article is an example of the confusion thus produced.—J. T.-W.]

## RENAL INFECTIONS (NON-TUBERCULOUS).

Dalziel,[12] in a paper on surgical kidney, emphasizes the importance of septic conditions of the teeth, tonsils, accessory nasal sinuses, nasopharynx, and particularly of the intestine or any septic wound as a cause, more or less continuous, of bacillæmia. While the patient is in good health, organisms entering the blood-stream will for the most part be readily destroyed; but a time comes when, under conditions of devitalization, as in overwork, underfeeding, exhausting diseases, etc., these organisms are not destroyed but are thrown out by the kidney. Thus, after surgical operations attended by shock and exhaustion, infected urine is not infrequently found in the absence of the passage of any catheter.

In a paper on ascending infections of the kidney, Kenneth Walker,[13] while recognizing that hæmatogenous infections of the kidney are the most common forms of infection of this organ, and that ascent of infection from the bladder to the kidney by means of direct spread along the surface of the ureter, although very infrequent, does occur in the presence of obstruction to the urinary outflow and incompetence of the sphincter guarding the opening of the ureter into the bladder, supports the view that, in a proportion of cases, infection may take place through the lymphatic system. By the last route, organisms are carried from the lower urinary passages to the kidney in the absence of all such complications as retention ; and infection from neighbouring lymphatic systems, such as that of the large bowel, may reach the kidney. Organisms placed in the urethra of a guinea-pig could be recovered from the lymphatic plexus surrounding the upper end of the ureter, some twelve hours later.

The author concludes that organisms in the lower urinary passages can easily reach the kidney via the peri-ureteral lymphatics, and that the renal capsule forms a link in the lymphatic chain connecting the upper and lower urinary tract, being the first situation in which organisms are found in cases of renal infection by the lymphatic route.

The course of the renal lymphatics consists of two networks. The superficial lies immediately beneath the renal capsule, and communicates, by means of converging trunks running in the fibrous septa of the kidney, with a deep plexus which lies in the substance of the kidney subjacent to the renal pelvis. From the latter the lymphatics run with the renal artery and vein to end in the juxta- and pre-aortic glands. The superficial plexus, in addition to communicating with the deep plexus, sends divergent trunks to a third plexus lying in the fatty capsule. The main renal lymphatic system is connected with the lymphatics draining the upper part of the ureter, the subdiaphragmatic plexus, and the lymphatics draining the ascending colon. Similarly free communication exists between the lymphatics of the upper, middle, and lower ureter, and between the last-named and the lymphatics of the bladder. Further, there is free communication between the lymphatics of the female genitalia and those of the lower ureter. The author considers that a different localizations of lesions in the kidney is much more likely to be dependent on the route by which infection has reached the kidney, than on the precise nature of the infecting organism.

Crosbie,[14] in an article on non-tuberculous pyelonephritis, lays stress on the fact that a simple pyelitis is very rare, the tubules also being involved to a varying degree. Pyelonephritis differs from acute Bright's disease pathologically, in that in the former the glomeruli are spared, this explaining why renal function in Bright's disease is much more disturbed. Perinephric abscess is rarely found with pyelonephritis, in spite of the frequency with which small abscesses are found beneath the renal capsule in the latter. *Bacillus coli* and *B. proteus* are the most common bacteria. Infection is nearly always bloodborne, but he considers that ascending infections may occur in the presence of obstruction. Infection may start in the lower urinary tract, and passes via the blood-stream to the kidney.

Symptoms depend on the severity of the inflammation, frequency of micturition being the most prominent. Pain is variable, and even with marked inflammation may not be a prominent symptom ; with much pus or mucus passing down the ureter there may be, however, severe colic. Rigors are frequent, especially at the onset, when they may be the only symptom. Hæmaturia is common in the acute stage, very variable in amount, and usually of short duration. Pus is always present in the urine sooner or later, while as a rule casts are not found. Albuminuria is not so marked as in acute Bright's disease, and the urine is not so scanty. In acute cases, especially in children, the patient may not look ill in comparison with the associated symptoms and signs, whereas in chronic cases there may be marked cachexia. Tenderness and resistance in the loins, more marked on one side, are usually, but not invariably, found. After the acute stage has passed, all cases should be cystoscoped, the urine from each kidney collected for investigation, and pyelograms taken to discover whether there has been any abnormality such as a kinked ureter, stone, or tumour, to prevent the process clearing up. Acute pyelonephritis tends to get well, and if a case becomes chronic there is generally some obstructive lesion to account for it.

As regards treatment, there is a tendency to recovery, and many kidneys that have been removed would have got well if left alone; this applies especially to the pyelonephritis of pregnancy, in which the uterus should be emptied rather than that a kidney should be removed. Where there is severe renal colic, **Ureteral Catheterization** and gentle **Pelvic Lavage** often help. In cases of chronic pyelonephritis, in which no obstructive lesion is found by pyelography, pelvic lavage with 2½ per cent **Mercurochrome** is beneficial, especially if little more than a bacilluria is present.

In an analysis of 200 cases of renal infection, in which no cases presenting definite surgical lesions of the kidney and lower urinary tract were included, Kretchmer[15] finds that 39 per cent were male, 61 per cent female, and that the largest number, 23·5 per cent, occurred between the ages of thirty-one and forty. Of 78 male patients, 31 had infection of the prostate, or vesicles, or both, and where this was cleared up, the kidneys also cleared up after appropriate treatment, whereas this was not the case if the genital infection was not dealt with. A definite history of constipation was present in 60. *B. coli* were found in 132 cases, staphylococci in 28, streptococci in 1, *B. coli* and staphylococci in 10, streptococci and staphylococci in 2, and in 27 the cultures were not stated; 99 cases showed positive cultures from both kidneys, 32 from the right only, 17 from the left only, and in 21 the bladder and both kidneys showed sterile cultures, although pus was demonstrated microscopically in these cases from both kidneys, bringing the total of bilateral cases up to 120. No evidence of tuberculosis or calculus was found in these cases.

In 177 cases cystoscopy was performed and in 128 of these there were found definite pathological changes, which varied in intensity from a slight hyperæmia around the internal meatus to a severe generalized cystitis. In some there was congestion or œdema of the trigone, and flakes of pus were found adherent to the bladder wall. In one the bladder was normal, but the ureters were dilated.

Pyelography in several was useful in showing a surgical renal condition, which might have been mistaken for pyelitis, and treated as such. Analysis of the symptoms showed the percentage of frequency to be 62, scalding micturition 37½, painful micturition 30½, turbid urine 32½, hæmaturia 24½, urgency 8, incontinence 5, difficult micturition 9½, nausea and vomiting 11½, sweating 9½, rigors 23, definite history of fever 37½. It would appear from the review of these cases that the causes for overlooking renal infection depend on the fact that a symptomatic diagnosis is frequently made without careful examination of the urine for pus and bacteria. The final diagnosis should rest on the result of examination of a ureteral catheter specimen.

A previous surgical operation had been performed in 44½ per cent of cases, and 13 had been operated on for urinary symptoms and were not relieved. In 11, urinary symptoms showed themselves for the first time after an operation; several of these appeared to be genuine cases of post-operative pyelitis. In 65, no definite connection could be traced between the operation and the onset of pyelitis. Kidney operations had been done in 7, and 4 of these were nephrectomies. Chronic and acute cases, after an appropriate course of medical treatment, he claims, derive great benefit from **Lavage of the Renal Pelvis** twice a week, or every five days, until the urine is sterile and free from pus. For children he prefers 1 to 3 c.c. of ½ per cent **Silver Nitrate Solution**, and for adults a 2 per cent solution, using 8 to 10 c.c. at a time. Of this series, no case was considered cured until the urine was free from pus, and cultures, taken on three occasions, proved negative.

As regards results, 2 patients died from coexisting pathological conditions to which the renal condition was secondary; 89 cases failed to complete treatment; 85 were cured by pelvic lavage, out of 128 treated by this means (66·4 per cent); 12 were cured without lavage. Of the cases treated by lavage, 12 were not cured; of these, 2 were found to have organic disease of the central nervous system, 3 had hydronephrosis, 3 chronic infection in the prostate and vesicles, 2 had no apparent cause for failure, 1 diabetes and hydronephrosis, 1 chronic morphinism.

Gorasch[16] states that metastatic hæmatogenous abscesses of the kidney occasionally develop in cases of bacteriæmia which may have its origin in such localized foci of suppuration as furuncles, carbuncles, etc.; such abscesses are found in the cortex, where capillary loops are abundant. He considers the great vascularity of the kidney to be more important than traumatism as a predisposing factor. He finds filtration of bacteria takes considerably longer than fluids, and the greatest hindrance to this is in the cortex. These abscesses must be distinguished from pyelogenous abscesses. Early diagnosis of hæmatogenous abscesses is difficult on account of their cortical localization, and is seldom made before operation when rupture into the pelvis or perirenal tissue has already occurred. The author could only find 21 reported cases, and in only 3 of these was diagnosis made before operation.

The primary causes of infection were parasites, furuncles, carbuncles, quinsy, parotitis, septic abortion, and gonorrhœa. The latent period between the primary infection and the development of symptoms of renal abscess is from two to six weeks, by which time the primary focus may be healed. The clinical picture develops rapidly in the guise of a general infection, being mistaken most frequently for influenza, typhoid fever, appendicitis, pleurisy, pneumonia, or lumbago. Examination of the urine is negative unless rupture into the renal pelvis occurs.

Pain in the region of the kidney, intense and of sudden onset, which is constant, radiating anteriorly but not towards the groin, associated with tenderness most marked at the attachment of the 11th and 12th ribs to the spine, and cutaneous hyperæsthesia and muscular rigidity, are most important symptoms. Leucocytosis is present, and renal function usually normal. On the right side the condition is most likely to be confused with appendicitis or cholecystitis. Untreated renal abscess usually leads to pyelonephritis. The earlier the operation, the more conservative it may be at first; incision and drainage of the abscess is sufficient. If abscesses are multiple, nephrectomy may be necessary, in which case the patient's general condition, the character of the infection, and the function of the other kidney must be considered; and, if nephrectomy is contra-indicated, nephrotomy should be done.

## TUBERCULOSIS OF THE KIDNEY.

Beer,[17] discussing chronic renal tuberculosis, emphasizes the importance of early diagnosis in view of its unilateral hæmatogenous origin. Ascending infection is, in his experience, only secondary to prostatic tuberculosis with involvement of the bladder, and this is rare. With secondary infection, signs of acute or chronic pyelonephritis, and occasionally calculus formation, are added. Perinephritic inflammation is almost always coincident. Frequency, urgency, painful micturition, pyuria, hæmaturia, and lumbar pain develop insidiously, usually in this order, and gradually increase in severity. Occasionally these symptoms develop rapidly. It is only when the tuberculous process extends to the excretory channels that the characteristic symptoms develop.

He did not find a 'premonitory albuminuria' prior to the onset of pyuria, but considered that all mild persistent and unexplained albuminuria should be regarded with suspicion. He calls attention to four groups of atypical cases: (1) Those with a massive hæmaturia as the first symptom, with or without ureteric colic; (2) Those in which pyonephrosis or hydronephrosis develops above a closed-off ureter, after a brief period of vesical irritation; (3) Those in which a mixed infection with or without stone-formation occurs, and in these tuberculosis may not be suspected until the kidney has been removed; (4) Those associated with perinephritis, especially the hyperplastic and suppurative types. In all the above types, except the first, a renal tumour is more likely to be present than in a typical case.

The disease is bilateral in about 10 per cent of cases when first seen; there is no real gain to the patient by nephrectomy of the more diseased organ in such cases. In at least 10 per cent of cases, after nephrectomy, an indolent sinus persists, and at times, some five or six weeks after operation, the whole wound breaks down, due to a tubercle bacteriæmia, induced by the operative manipulations. For persistent post-operative bladder symptoms, **Sandal-wood Oil** internally, **Cystoscopic High-frequency**, and **Cauterization** of bladder ulcers give the best results.

Hyman and Mann,[18] in an article on the laboratory diagnosis of renal tuberculosis, review 126 cases. They consider the finding of tubercle bacilli in a catheter specimen from the bladder or kidney no absolute proof of renal tuberculosis, and quote Beer as pointing out that tubercle bacilli may be found in ureteral catheter specimens under three conditions: (1) In the presence of a tuberculous focus in the body, with excretion of bacilli via a non-tuberculous kidney; (2) In the presence of a tuberculous focus in the genital or lower urinary tract, by contamination, or by ureteral reflux; (3) When the tuberculosis is in the upper urinary tract or kidney.

In the first type of bacilluria, the organisms are, as a rule, present in such small numbers that they can be demonstrated only by inoculation methods, and not in smears. The authors consider that the presence of bacilli alone in smears, or in ureteral catheter specimens, does not justify a diagnosis of renal tuberculosis: pus or microscopic blood should be found associated. In the second type, the bacilli may reach the kidney in a reflux of bladder fluid, up the ureter, and alongside the catheter; or by being carried up with the catheter, either from the posterior urethra, or bladder, or from a secondary tuberculous urethritis, resulting from the extension of a tuberculous vesiculitis.

In 28 cases of unilateral renal tuberculosis in this series, the authors inoculated urine from the supposed healthy kidney into guinea-pigs. In all these cases the urinary and cystoscopic findings and smears gave no evidence of disease of these kidneys; yet in 5 cases (18 per cent) the urine obtained from them by ureteral catheter gave a positive guinea-pig test.

The writers consider that if one accepts as sufficient evidence of renal tuberculosis the presence of tubercle bacilli in urine, free of pus and albumin, patients will be refused nephrectomy who otherwise might stand an excellent chance of cure: on the other hand, numerous cures following nephrectomy for bilateral renal tuberculosis will be reported if these criteria are accepted as evidence of such involvement. They conclude that the smear is a simple and rapid procedure, gives positive results in at least 65 per cent of cases, and for these reasons is of greater value than inoculations, which are so time-consuming as to render them impracticable as a routine procedure, though occasionally a guinea-pig test will draw attention to a case of renal tuberculosis which could not have been detected by other means.

Chute,[19] discussing the causation of renal tuberculosis, assumes that all tuberculous invasions of the kidney are hæmatogenous and secondary to a focus elsewhere in the body. He states that he has seen very few cases in which infection spread by lymphatics from a chest focus or from the bladder via the ureter. As anatomical evidence of old tuberculous processes is frequently found in the apices of the lungs of persons who never showed definite symptoms of pulmonary tuberculosis, it is probable, he states, that incipient and very mild renal tuberculosis also is much more common than is generally believed. If a hæmatogenous origin is accepted, we must assume that bacilli are brought in approximately equal numbers to both kidneys, that small cortical infections are common, and that in the great majority of cases these are overcome. Only when the kidney is especially susceptible by reason of injury or some other cause, does the lesion progress to the stage where the condition is recognizable through the presence of pus in the urine. When pus is found in the urine, the condition has reached an advanced stage and cannot be brought to a standstill before the renal function has been destroyed.

Some of the patients who complain of dull pain in one loin, and whose urine is sterile, but contains a few blood-cells and leucocytes, are in all probability carrying on a struggle to determine whether a tuberculous infection will overcome a slightly infected kidney or vice versa. These patients should be advised of the importance of **Rest, Fresh Air,** etc., in order that their resistance may be raised to the highest level.

André and Grandineau,[20] in a paper on ureteral reflux in the second kidney in the course of renal tuberculosis, report three of their own cases and two found in the literature, in which the reflux was into the non-tuberculous kidney. In no case was there tuberculous involvement of the kidney towards which the reflux occurred, although in some there was evidence of ascending infection in the ureter on this side. Almost all cases previously reported showed the reflux to be on the tuberculous side only. They consider that the changes in the intramural ureter, and the intensity of the bladder contraction, caused the reflux into the second ureter. For this to happen the tuberculous changes in the bladder are not necessarily gross. Ureteral reflux in the second kidney raises the possibility of error in the interpretation of the results of ureteral catheterization. Thus, with evident tuberculosis in one kidney, and bacilli and pus in the urine from the other, bilateral disease might be deduced when there was merely a reflux in the second kidney. In cases of slight reflux in the opposite kidney, with no ureteral dilatation or pyelitis, removal of the diseased kidney in unilateral cases always results in rapid improvement of the bladder condition and cessation of the reflux. When the reflux in the opposite kidney is marked, and associated with ascending dilatation, the bladder condition will not be improved by nephrectomy and the reflux will continue.

The authors state that this condition is best treated by permanent **Lumbar Drainage** by a simple nephrotomy, in order to obtain complete vesical exclusion without ligating the ureter. They consider it advisable also to establish this drainage of the renal pelvis before removing the tuberculous kidney, especially when the function of the non-tuberculous is clearly diminished. If the function of the non-tuberculous kidney is very poor, even a nephrotomy should not be attempted.

Woolff[21] describes 'closed' renal tuberculosis in detail on the basis of 9 cases. The condition is rare, occurring in about 10 per cent of renal tuberculosis cases ; 88 cases have been reported, of which only 21 were correctly diagnosed. The obstruction is caused either by an obliterating urethritis, or by plugging by cheesy débris or blood-clot ; it is not necessarily permanent, and in some cases is intermittent. If obstruction occurs early, a general dilatation takes place above it; but if it comes on late, and is gradual, shrinking and incomplete destruction of the kidney results. Clinically, two groups are found, according to whether the disease has remained limited to the kidney and ureter; or, as occurs in four-fifths of the cases, there is associated involvement of the bladder. In the former, diagnosis may be rendered difficult by normal cystoscopic findings; in the latter, diagnosis should not be difficult. A large kidney tumour is rare; and when the affected kidney is small and sclerotic, the other kidney may be felt enlarged. With permanent ureteral obstruction, the urine may be normal; usually, however, there are signs of toxic damage to the other kidney, albumin, casts, leucocytes, and red blood-cells being found.

## RENAL AND ADRENAL GROWTHS.

Derrick[22] discusses the pathogenesis of renal tumours on the basis of a study of 66 cases of renal and adrenal growths, which were as follows: Tumours of the kidney: Wilms' mixed tumour 4, adenoma 20, Grawitz' carcinoma (hypernephroma) 18, embryonal carcinoma 3, carcinoma of the pelvis 4, capsule tumours (fibroma 2, lipoma 1) 3. Tumours in the suprarenal gland: adenoma of cortex 5, carcinoma of cortex 8, neurocytoma of medulla 1. The Wilms tumour, rapidly growing and malignant, almost invariably attacks infants, 75 per cent occurring before the age of 5, and the majority of the remainder before the age of 10. The Grawitz tumour is by far the most common, forming about 70 per cent of all renal tumours. It arises in any part of the cortex, and varies greatly in size. It does not as a rule infiltrate the kidney, being separated by a fibrous capsule.

As regards renal adenomata, he states that as a rule the lining epithelium of the retention cysts not uncommonly found in the cortex of a chronically inflamed kidney becomes flattened and degenerate. Occasionally, however, the lining cells are high columnar and healthy looking, and papillary processes may grow from the cyst wall and project into the cavity. Their formation represents, the author states, the crossing of the boundary from compensatory hypertrophy to the feeblest type of new growth, the papillary cystoma. With continued growth and repeated branching of the papillary processes the cyst cavity becomes filled up, with resulting pressure atrophy of the epithelial lining. Sections of such a condition show the structure of the tubular adenoma, which, he states, cannot be distinguished with the naked eye, or without difficulty microscopically, from a small Grawitz tumour. He considers it possible to arrange these tumours in a progressive series which begins with the hypertrophying cells of the renal tubules and continues unbroken through the various adenomata and the Grawitz tumours to the most malignant type of all, a carcinoma simplex. For the most part the fundamental structure is similar, the variant being the degree of activity. The types at each end of the series, the adenoma and carcinoma simplex, are accepted as renal, and thus it is impossible to doubt the renal nature of the intermediate members, so that the Grawitz tumour must be regarded as a carcinoma of the renal tubules. Tumours of the suprarenal, if Grawitz tumours grow from suprarenal tissue, should exactly parallel the latter, which they do not. Tumours of the adrenal cortex may be adenomata, which are very similar in structure to the zona fasciculata of the normal gland, or carcinomata, which in their least active parts have this simple structure; but in more malignant areas the cells are polymorphous with large nuclei, frequently multiple or dividing and without any systematic structure. A papillary type of cell arrangement is very rare in adrenal derivatives, the vast majority of adrenal tumours being solid, so that the predominence of papillary structure in Grawitz tumours is convincing argument against their adrenal nature. Adrenal carcinoma is much more malignant than Grawitz tumour, is imperfectly encapsuled, and frequently infiltrates neighbouring organs, its course being very rapid, and general dissemination occurring in a few months. In contrast, the Grawitz tumour is rounded and well demarcated, rarely infiltrating the kidney or growing diffusely. It is of slow growth, and not uncommonly symptoms exist for years before operation ; and a remarkable feature is the way in which, long before primary tumour is suspected, a secondary growth may lead the patient to seek advice, in spite of metastases being few in number, and at times solitary and often late. Of the three classical symptoms of Grawitz tumour—pain, hæmaturia, and palpable tumour—pain is the only one that occurs frequently with adrenal carcinoma ; but with the latter, in addition, general weakness and loss of weight are almost invariable, and occasionally sex abnormalities are associated in patients under 40, the last being never seen with the Grawitz tumour. The author considers chronic inflammation of the kidney to be an important factor in the production of both renal adenomata and Grawitz tumours, and states that out of 52 cases of such growths only 4 were free from chronic nephritis.

Wright[23] publishes a study of the surgical pathology of hypernephroma, and gives details of 19 cases.

Bugbee[24] draws attention to the fact that, while hypernephroma is of frequent occurrence, true renal carcinoma is relatively rare. He considers the conditions most likely to be confused with malignant renal tumours are (1) 'essential hæmaturia', (2) retroperitoneal tumour, (3) bilateral cystic kidney, (4) closed pyonephrosis. In the great majority of cases he finds a pyelogram clears up the diagnosis.

Quinlan[25] records two cases of *carcinoma* of the kidney, which he considers primarily of renal-cell origin, because of a papillary arrangement of the cuboidal cells, much like that of an adenoma of the kidney, and also because in the adrenal gland, invaded by the renal growth, he finds groups of typical adrenal cells which can easily be differentiated from those of the invading growth. These cases show that carcinomata of renal-cell origin may exhibit many of the characteristics of malignant hypernephromata of adrenal-cell origin, such as a marked tendency to invade the renal vein ; this, he thinks, is not surprising, because the cells from which they originate are, embryologically, so similar.

Denos[26] analyses three cases of *osteofibroma* of the kidney. In one case of his own, after an attack of profuse and prolonged hæmaturia, there was a lull for ten years, with only a little vague pain. Then intermittent hæmaturia and more severe pain came on, and hydronephrosis was suspected. Nephrectomy gave complete relief for three months. The tumour proved to be an osteo-lipo-fibro-adenoma of the kidney, and, numerous metastatic tumours developing rapidly throughout the abdomen, death occurred five months later.

Heppner,[27] writing on a series of 53 cases of renal tumours operated upon, states that sudden hæmaturia, or the accidental discovery of a tumour, was usually the first sign of trouble. The dull pain sometimes noticed was usually ascribed to rheumatism. Fever occasionally aids in the detection of malignant disease in the kidney, but the urine is of little help in differential diagnosis. He states that pain in the shoulder on the corresponding side is suggestive. Recurrence of the tumour occurred in 6 of the 53 cases, and the total mortality to date is 45·4 per cent.

Curtis and Potel[28] describe a *suprarenal tumour of the abdominal walls* in a woman, age 68. An ovoid pulsating tumour lying transversely just above the umbilicus adherent to the overlying discoloured skin had been present for six years, and lately had begun to bleed and increased rapidly in size. On removal, it weighed 190 grm., and was very vascular. Microscopically there was a cortical and medullary zone in normal relative proportions as compared with the suprarenal gland. It was diagnosed as a subcutaneous metastasis of a suprarenal tumour. No sign or symptom of a deep tumour in the renal or perirenal region was present, and post-operative recovery was complete.

Kaiser[29] describes a case of a huge perirenal urinary cyst which developed after the passage of a waggon wheel over the abdomen of a young man. Early collapse, with signs of peritoneal irritation, and retention of fæces and flatus, came on, but there was no fever and hæmaturia. Then on the twelfth day, swelling of the right flank, with absence of an efflux from the right ureter, supervened. Three weeks after the accident, the cyst was exposed through a lumbar incision, and several litres of urine were evacuated at the same time; the partly necrotic kidney, together with the upper ureter, was removed, with subsequent uneventful recovery. The diagnosis between hydronephrosis and peritoneal urinary cyst was made by the production of pneumoperitoneum.

Sohn[30] reports two cases of spontaneous *perirenal hæmatoma*, and reviews the histories of cases reported since 1910. He distinguishes cases of primary renal hæmorrhage, in which the hæmatoma is originally within the renal capsule, and cases in which the bleeding has led to an extracapsular perirenal hæmatoma. One of Sohn's cases is of the latter type, that of a woman of 64, upon whom laparotomy for 'ileus' was performed. The fibrous capsule of the left kidney was found to be ruptured, and an extensive retroperitoneal hæmatoma was evacuated. The patient died of cerebral embolism thirty-seven days later. Arteriosclerosis with sclerotic contraction of the kidney was regarded as the cause. Amongst the causes of spontaneous renal hæmorrhage are erosion of renal vessels by tumours or tuberculosis, the rupturing of aneurysms, and hæmophilia, and these usually produce intracapsular bleeding. The causation of extracapsular hæmatoma is usually doubtful; in many cases hæmorrhagic perinephritis is blamed; but this does not account for the frequent sudden severe pain in the loins, signs of internal hæmorrhage, and the development of a retroperitoneal tumour, with vomiting—at first reflex, but later, if intestinal paralysis occurs, fæcal in type. Melæna, jaundice, and fever are less frequent. The second case was an intracapsular hæmatoma, of which the cause could not be found at operation.

## RENAL CALCULUS.

Graves[31] discusses the diagnosis of shadowless renal calculi with special reference to those of cystin composition, and presents two cases, in the first of which the calculus was of cystin, and in the second, although the calculus could not be examined owing to its spontaneous passage, it was thought to be of the urate group.

In the first case the diagnosis was made by pyelography. There was no evidence of pelvic dilatation, and the calices were slender and cupped; but in the centre of the main collecting portion of the pelvis, where the depth of fluid should have been greatest and the shadow therefore most dense, an oval area of definitely decreased density was seen. Several days later pyelography was repeated with the same result, diagnosis being confirmed by the passage of a wax-tipped catheter on the wax bulb of which linear scratches of calculous origin were seen. At subsequent operation a fair-sized cystin calculus was removed from the renal pelvis. In the second case, cystoscopy showed occasional slight bleeding from the left ureteric orifice, and obstruction was found about 3 cm. up the ureter. *X*-ray pictures showed a very small faint area of opacity at the tip of the catheter; but a ureterogram revealed, just beyond the catheter tip and interrupting the shadow of the filled ureter, an oval area of decreased density about 1 cm. in length, above which there was well-marked ureteral dilatation. The patient refused operation, but some time afterwards stated that he passed a stone.

Geraghty, Short, and Schanz,[32] in an article on multiple renal calculi, and branched (stag-horn) calculus, discuss the indications for operation and the choice of operation. Multiple stones scattered throughout the kidney, for the complete removal of which a nephrectomy would be necessary, they consider should be left undisturbed. Should pain or symptoms due to infection necessitate operative relief, nephrectomy (the opposite kidney being satisfactory), they think, is to be preferred to nephrolithotomy on account of the danger of secondary hæmorrhage, and the extensive destruction of renal tissue consequent upon suture to control this. Nephrolithotomy, done in the presence of infection, results in even greater damage to function, for to the destruction resulting from the suturing is added that of impaired drainage of infection in areas included in the suture. Urinary fistula frequently persists from the subsequent dislodgement of small calculi overlooked at operation. Certain cases occur, however, in which stones are of a size, and occupy a position, which allow of their removal by pyelolithotomy, or through several small nephrolithotomy wounds, or both. Consideration of the number, size, and position of the stones, their relation to the pelvis and calices, and the presence or absence of an extrarenal pelvis (and to determine these points pyelography is invaluable), will enable the choice of operation to be made.

Referring to branching calculi, they state that in their experience the function of these kidneys is usually surprisingly good, even in the presence of infection. Only exceptionally do these stones cause obstruction, resulting in hydronephrosis, or pyonephrosis, and, when they do, this is usually due to the downward extension of the stone into the ureter. In their removal, complete nephrolithotomy is always required, and the resulting renal impairment will usually be greater than would be produced by the stone over a period of years. Small fragments are easily overlooked, and, if they do not cause a permanent urinary fistula, will certainly lead to the re-formation of the calculus. The authors consider that such kidneys should rarely be operated on, and, when operation is necessary, nephrectomy should be done.

Young,[33] in an article on the post-operative treatment of urinary lithiasis, states that apart from the immediate treatment of the damage due to operation, measures for the prevention of recurrence of calculi must be taken. Prophylactic treatment of any condition presupposes an accurate knowledge of its etiology, and this knowledge we lack about stone-formation. Mayo gives the percentage of recurrence as not over 10, Braasch as between 14 and 15, Cabot and Crabtree as nearly 50, while Barney reports about 20 per cent of recurrences. After describing in detail the mechanism of stone-formation. primary and secondary, the writer states that the first thing to do on the removal of a stone is to have an accurate chemical analysis made. As regards treatment, whatever the chemistry, attention to the general health, keeping open the various channels of elimination, the avoidance of alcohol and limitation of tea and coffee, and moderation in diet, are important. In calcium oxalate and uric acid calculi, **Diet** should be regulated. Secondary phosphate stones are found in alkaline urine, and are readily soluble in weak acids; thus the most important point in their prophylaxis is to keep the urine acid (the best drug for this purpose being **Acid Sodium Phosphate**), and to prevent the development of any condition tending to cause retention of urine, together with regular and frequent bladder-washes.

Barney,[34] in a paper on recurrent renal calculi, analyses 139 cases, of which 108 were men and 31 women, the majority between twenty and thirty years of age. In 60 there was no tenderness in the region of the stone-bearing kidney at the time of examination ; pus was found alone in the urine in 59 cases, and combined with blood in 41. Blood was found alone in 26 cases, while in 12 the urine was persistently negative. A positive *x* ray was recorded in 125 cases. In 24 of the cases the only stone, or one of several, was passed spontaneously after ureteral catheterization, showing that even this gentle manipulation is often all that is necessary to bring about conditions favourable to the passage of calculi. In 64 cases pyelotomy, in 13 pyelotomy combined with nephrotomy, generally partial, in 17 nephrotomy, of which 3 were bilateral, and in 39 cases nephrectomy was performed. There were 5 deaths (3·5 per cent mortality). As regards after-results, in 20 cases *x*-rayed during convalescence, 9 showed stones still remaining ; this is of importance, as with a positive *x* ray taken six months or a year after operation it is impossible to distinguish between a stone left behind and a true recurrence. Of the 77 cases in which pyelotomy was performed, there was apparent recurrence in 32·8 per cent ; but as all these were not *x*-rayed during convalescence it is impossible to say how many positive results were due to the incomplete removal of stones. After nephrotomy, stones were subsequently found in the kidney in 30·3 per cent. The author considers that these figures point to a serious problem that must be faced, for a second operation in such cases may be an undertaking of the first magnitude, endangering not only the kidney but even the patient. The difficulty of complete removal of stone from the renal pelvis, he attributes to the great complexity of this cavity, together with the calices ; to the operator being too readily satisfied by the finding of a stone which resembles the *x*-ray shadow both in size and shape, and which shows no facets or evidence of fracture, and hence failing to explore the pelvis thoroughly ; to the ready hæmorrhage resulting from manipulation or probing of the kidney, with the deposition of clot around any other stone present ; and, lastly, to the fact that the stone or stones may slip unobserved into a dilated ureter or even into the perirenal tissues during operation.

To obviate mistakes in this respect an *x* ray should be taken as near as possible to the time of operation, preferably the same day. Careful and accurate pre-operative study is essential, and should include pyelography. The utmost care should be taken to avoid bleeding, although needling of the kidney with a blunt probe at a suspected spot is often of the greatest value. Gentle tapping of the kidney to shake a stone from a calix into the pelvis is often of value. In extracting a stone, great care must be used to avoid breaking it ; and if fracture occur, the pelvic cavity and the calices should be thoroughly and forcibly irrigated with hot saline solution. Finally, when available, *x*-ray screening used in conjunction with the operation by a trained observer offers great possibilities of success in the detection of stone which might otherwise escape removal.

Fronstein[35] discusses the complications of nephrectomy. Peritonitis, the result of opening the peritoneum, if the opening is recognized and closed immediately, can usually be avoided. The separation of close adhesions to the colon may lead to fæcal fistula ; when such adhesions are present, he advocates a primary intestinal resection. An occasional complication is intestinal gangrene ; it is rare, but may be due to roughness on the part of the assistant displacing the kidney by pressure on the anterior abdominal wall. Intestinal hæmorrhage may follow nephrectomy, and is to be ascribed to venous thrombosis of the mesentery. Pneumothorax and empyema may follow injuries of the pleura, but with immediate suture these are avoided. Hæmorrhage, the most dangerous complication, may be from normal renal vessels, supernumerary renal vessels, the vena cava, or the iliac artery. Retrograde emptying of the urine from the bladder through the stump of the ureter is rare. Sacculated suppurations in the stump of the ureter following nephrectomy for pyonephrosis occur from time to time. In renal tuberculosis, unless the ureteral stump is carefully treated, obstinate fistulæ frequently result. The ureter should be resected only as far as can be done without difficulty, the stump doubly ligated with catgut, crushed with a clamp, and burned through with the thermocautery. Anuria following nephrectomy, although usually due to functional deficiency of the remaining kidney, may occur after even the most satisfactory findings in the second kidney. The author reports such a case in which at autopsy the second kidney showed acute parenchymatous nephritis. Hæmaturia during the first few days after nephrectomy the author found to be constant microscopically, if not to the naked eye, even when the other kidney was normal.

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## LABOUR.

*W. E. Fothergill, M.D.*

*Pituitary Extract Indications and Contra-indications.*—R. S. Cron[1] analyses 150 cases of the use of **Pituitrin** in labour at the University Hospital, Michigan. He finds that labour can be induced in about 65 per cent of cases by the oral administration of castor oil and quinine, with repeated small intramuscular injections of pituitary extract. For the treatment of primary uterine inertia the extract should be used most cautiously and only in very small doses. In secondary uterine inertia the judicious use of pituitrin presents great advantages. The administration of 1 c.c. as a routine during the third stage of labour is advocated. In Cron's cases the average loss of blood was reduced from 330 c.c. in the control cases to 255 c.c. in the pituitrin cases. The third stage was shortened from an average of 35 minutes in the controls to an average of 12 minutes. In post-partum hæmorrhage pituitrin is of great value, and Cron also favours its use as facilitating the closure of the uterine incision in cases of Cæsarean section.

G. L. Brodhead and E. G. Langrock[2] administered hypodermically 1 c.c. of **Infundibulin** to each of 100 patients immediately after the birth of the child. They waited 'the customary twenty minutes', and then expelled the placenta. All blood lost before and during one hour after the birth of the placenta was measured. In 19 cases the placenta was born spontaneously after an average time of ten and a half minutes. In 3 cases manual extraction was required. In the remainder expulsion seems to have been done at the end of twenty minutes, the placenta having then left the uterus. The average blood loss was 110 c.c. in primiparæ and 153 c.c. in multiparæ during the third stage, and 47 c.c. in primiparæ and 36 c.c. in multiparæ in the hour after the end of the third stage. The observers conclude that the blood loss is materially reduced by the use of pituitrin, and that there is no increase in the number of cases of retention. It is to be regretted that these observers worked by the clock and expelled the placenta at the end of twenty minutes when it had not already escaped from the vagina. Their results would have been more valuable if they had conducted the third stage in the proper manner and had expressed when the usual signs indicated that the placenta had been separated from and had left the uterus, without waiting for any special number of minutes to elapse. In Ryder's pituitrin cases the loss of blood averaged 180 c.c., which corresponds closely with the 177 c.c. recorded by Brodhead and Langrock.

References.—[1]*Amer. Jour. Obst. and Gynecol.* 1922, March, 300; [2]*Ibid.* Feb., 170.

## LARYNX, DISEASES OF.

*A. J. M. Wright, M.B., F.R.C.S.*

### Carcinoma of the Larynx.—

*Classification.*—Further advance has been made in the classification of cases of laryngeal carcinoma from the point of view of prognosis and treatment. As a result of further experience, StClair Thomson[1] now suggests the division of cases into three groups: (1) Intrinsic; (2) Subglottic; (3) Extrinsic.

The intrinsic is the most common variety, usually involving the anterior half of the vocal cord, and, owing to the fact that hoarseness is produced early, diagnosis is frequently early also. This is the most favourable variety of growth for operation; and laryngo-fissure, with removal of the affected cord, gives a cure in 80 per cent of the cases. On the other hand, the subglottic carcinoma is the rarest variety. Frequently it does not present symptoms until relatively late, and may be accompanied by glandular involvement. The majority of these cases require a laryngectomy, and the outlook is not good. In the third group, of extrinsic carcinoma, symptoms vary with the site of the lesion, and are often slight at first; hence diagnosis is delayed. Glands are involved early, and the growth is as a rule rapidly growing. Laryngectomy or lateral pharyngotomy, as described by Trotter,[2] are the only available operations. Jackson[3] suggests a somewhat similar classification into anterior intrinsic, posterior intrinsic, and extrinsic, respectively. For the first he advises the operation of laryngo-fissure, and for the two latter either laryngectomy or the use of radium.

*Laryngectomy.*—Although the technique of this operation has been considerably improved, the mortality is high, and, what is even worse, the incidence of recurrence after its performance is also high. A most important recent improvement in technique has been the introduction of the use of a nasal feeding tube. This is inserted through the nose and down the œsophagus, and is left in for some days after operation, thus permitting immediate feeding without infection of the wound. In cases in which the new growth is confined to the larynx and does not involve the gullet, the operation is probably well worth while. In this class of case, Wood[4] gives, of 21 cases, 3 died within a month, 2 within a year, 4 within two years, 1 within three years, 1 within five years, 1 within eight years, and 9 still living three to nine years after operation. On the other hand, where the gullet is involved in the growth, results are almost uniformly bad. The patient whose larynx had been removed was formerly regarded as being more or less permanently speechless, although some of these cases may have had a weak pharyngeal voice. Wood points out that probably in every case, if sufficient trouble is taken, the patient can be taught to produce a pharyngeal voice, which is quite efficient for ordinary use. The individual must be taught to gulp air into the pharynx and produce the voice by its expulsion. This is more easily accomplished by these individuals because the anterior wall of the pharynx is soft owing to the absence of the larynx. A useful method of commencing the lesson is to give them in succession solutions of bicarbonate of soda and citric acid to drink, and persuade them to attempt to phonate as the gas is belched up from the stomach. Wood also states that these patients can swallow normally and have no increased tendency to bronchitis.

*Radium.*—Radium is still being extensively used as an alternative to operation in cases of laryngeal carcinoma. Quick and Johnson[5] conclude, as a result of experience with 156 cases, that radium should only be employed where operation is hopeless. The greatest difficulty in the use of radium is its accurate application to the growth, and they suggest that it is sometimes worth while exposing the growth by an external operation for this purpose. They do not advise its use in the most advanced cases. Tapia has found that in the great majority of cases $x$ rays and radium produce no improvement, and in some cases actually accelerate the growth. As suitable cases cannot be recognized beforehand, the treatment should be confined to those which are inoperable or in which operation is refused.

**Stenosis of the Larynx.**—Hobday[6] has recently suggested that an operation which is used on the horse as an alternative to tracheotomy might possibly be found helpful in man in cases in which laryngeal obstruction is due to a paralysis of both vocal cords. In the horse, a condition known as roaring is due to laryngeal obstruction from a paralysed vocal cord. The operation known as ventricle stripping consists in removing the saccule of the larynx through an external incision, and as a result of this operation cicatricial contraction takes place, drawing the vocal cord outwards and thus widening the glottis. Vlasto[7] investigated this possibility by dissection of the larynx in horse and man and by operation on the cadaver. He came to the conclusion that the operation was unsuitable in man, because the saccule is in less close relation to the vocal cord and is only isolated with great difficulty. Jackson[8] has practised an operation of a somewhat similar type. Under the direct method, he punches out the ventricular band down to the ventricular floor in its anterior two-thirds, thus producing a cicatrix which draws the cord outwards. Its use should be confined to old-standing cases, and gives the best results where the obstruction is solely due to a bilateral paralysis of the cord with no superadded cicatricial condition.

**Intubation.**—One of the great disadvantages in the use of intubation of the larynx has been the coughing up of the tube, with the risk of asphyxia before skilled assistance can be obtained. D'Anna[9] has found the method first suggested by Pulverini effective in preventing this. A double piece of strong silk is passed on a needle through the thyrohyoid membrane up and out through the mouth. The upper ends are tied to the intubation tube, which is inserted as usual, and the lower ends are tied over a roll of gauze on the front of the neck, thus keeping the tube down in its place.

**Laryngeal Tuberculosis.**—The employment of antiseptic oily solutions in the treatment of laryngeal tuberculosis is of service in diminishing the pain, preventing infection by coating the larynx, and to some extent sterilizing the sputum. The only effective method of using them, however, in the past has been by intralaryngeal or tracheal injection. The fact that these have to be administered by the surgeon has greatly lessened their utility. Seymour Jones[10] has devised an apparatus by means of which the patient can administer such injections to himself, in the treatment of either tuberculosis or other chronic disease of the larynx. It consists essentially of a U tube, into which the dose is placed. To one end of the U a bellows is attached, and to the other a soft rubber catheter. The latter is lubricated and passed through the nose on its most patent side until the end is visible below the soft palate through the mouth. The patient then squeezes the bulb three or four times, at the same time taking a deep inspiration. It is advisable that the surgeon should ascertain that the catheter is correctly placed on the first occasion. Injections may be used daily. As a result of his experience, he found that there is a diminution of cough and expectoration, and an alleviation of pain. Dundas Grant[11] points out that an even more simple method is effective. About half a drachm of the oily solution is poured by means of a small glass syringe into the patient's nostril while he is sitting up with the head thrown back and the mouth open. The patient should continue breathing gently and resist any inclination to swallow. Lukens[12] has found a solution of 10 per cent of **Chaulmoogra Oil** in liquid paraffin the most suitable intralaryngeal injection.

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## LATHYRISM.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

H. W. Acton[1] reports on an investigation of this disease in the North Rewah State in India, where he saw over 200 cases. The disease has long been known to be due to the poor people living almost exclusively on *Lathyrus sativus* or *kesari dal* during times of famine or scarcity. This vetch is grown locally, and imported from Bhagulpur in Bengal, the disease being most common in parts of the Central Provinces and the United Provinces, where the poisonous properties of the plant are well known to the people, who only consume it in sufficient quantities to cause paralysis when compelled to do so by famine or by the harwar system of bondage; under this the people sell themselves to the Brahmin or Thakur owners, who can even sell their children, and who in times of scarcity feed them solely on the cheap *kesari dal*: a terrible condition of affairs still surviving in the Indian-governed State. Acton has established the important fact that the poison is very soluble in water, and therefore can be removed by soaking the grain in three changes of water during twenty-four hours, and although this would interfere with the making of flour, it can still be used for food by other methods of cooking. The majority of cases come on in the rains, especially in July, when other food supplies become short in years of scarcity. Only the large-grained Bhagulpur variety is poisonous, while the locally grown small variety is not so, and the former is not injurious if sufficient other food substances are also eaten.

The stages of paralysis are described and illustrated. It is essentially a spastic paralysis of the muscles of the lower extremity without any involvement of sensation or of the bladder and rectal reflexes, and the symptoms point to a partial lesion of the strio-spinal motor system below the second lumbar root, although post-mortem evidence is not available. The poison is probably an amine, and it is being investigated in the chemical laboratory of the Calcutta School of Tropical Medicine. When once established the paralysis is completely incurable; so prevention is imperatively called for.

Reference.—[1]*Ind. Med. Gaz.* 1922, July, 241.

## LEAD POISONING. (*See* Industrial Diseases.)

## LEISHMANIASIS, DERMAL (Oriental Sore).

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

W. H. McKinstry[1] has tested the Wassermann reaction in cases of Oriental sore, and found all but 1 of 28 cases negative; the exceptional case showed evidence of syphilis in addition. M. L. Treston,[2] in Mesopotamia, found the incubation period to vary between three and six months, and the cases to be more numerous in the cold season, and he describes a resistant form of thrombosis occurring in 0·7 per cent of the cases. In the early stages **X Rays** and local application of **Permanganate of Potash** were best; in a fairly advanced stage permanganate locally and **Tartar Emetic** intravenously; and in the more advanced stage **Scraping** under chloroform, and ol. ricini dressings, except in those of the face, in which tartar emetic alone is indicated. A marked improvement usually follows the second injection, and healing takes place within a month. D. K. Smith[3] thinks the incubation period to be from a few days to several weeks, usually six to nine, while auto-inoculation occurs. **X Rays** and **Arsphenamin** and **Neo-arsphenamin** are worthy of trial.

References.—[1]*Brit. Med. Jour.* 1922, i, 185; [2]*Lancet,* 1921, ii, 270; [3]*Arch. of Dermatol. and Syph.* 1922, Jan., 69.

## LEPROSY.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Etiology.—L. Rogers,[1] in an address on the spread, probable mode of infection, and prophylaxis of leprosy, after tracing the spread over the world, points out that all the places with the highest leprosy incidence are in hot, damp, tropical countries. He gives a table of 700 cases in which the probable source of infection was traced, which shows it to be nearly always a house infection.

Treatment.—L. Rogers[2] has summarized his Indian investigations on the treatment of leprosy and indicated its important bearing on the tuberculosis problem. E. Muir[3,4] deals with the present position of leprosy in India, and points out that only advanced cases are returned in the census figures, which greatly underestimate the total numbers: only 2 of 30 lepers he was treating have entered themselves as such in the recent census forms. The pauper lepers probably number 100,000, and only 8850 are in asylums, while he estimates 5 to 10 lepers to every pauper one. Education propaganda is necessary to teach the danger of association with lepers. After summarizing recent results of treatment already recorded in this work, he recommends the following 'E.C.C.O.' mixture as convenient, effective, and painless, intramuscularly:—

| | | |
|---|---|---|
| ℞ | Ethyl Esters of the Fatty Acids of Hydnocarpus Wightiana Oil | 1 c.c. |
| | Pure (double distilled) Creasote (as an antiseptic) .. | 1 c.c, |
| | Camphor .. .. .. .. .. .. | 1 grm. |
| | Olive Oil .. .. .. .. .. .. | 2½ c.c. |

The camphor to be dissolved in the creasote and added with the ethyl esters to olive oil which has been heated to 96° C. for half an hour on a water-bath and then cooled. The more extensive the tubercular lesions the smaller should be the initial doses, beginning with 0·25 c.c. twice a week and gradually working up to 2 to 5 c.c. by increases of 0·25 c.c. at each dose, as long as no marked febrile or local reaction occurs, in which case the same dose should be repeated. After 2-c.c. doses have been reached, intravenous injections of Harper's mixture, containing **Chaulmoogra Oil** 500 min., **Sulphuric Ether** 500 min., and **Iodine** 1 grm., may be given in doses commencing with 10 min. the first three days, and of 20 min. later; or the ethyl ester itself may be given safely intravenously in doses gradually increased from 0·5 to 2 c.c., injected very slowly with a tuberculin syringe, at least one minute to each c.c.; the intravenous injections may be given alternately with the intramuscular ones each once a week as long as a temperature reaction of over forty-eight hours—the patient taking his temperature four times a day—does not occur. When full doses cause no reaction for two weeks, the intravenous injections may be increased to 4 or 5 c.c. a week, totalling 15 to 16 c.c., with rapid improvement. The drug acts by destroying the lepra bacilli, so little good can result in late deformed anæsthetic cases with little or no bacillary infection left. The esters are prepared for intravenous injection by boiling for half an hour on a water-bath, and up to 0·2 per cent of iodine may be added, but it is not necessary.

For intramuscular use 1 per cent of iodine may be added, while 5 per cent creasote will soon render the solution aseptic and have some therapeutic value of its own. Instructions regarding diet are also given, including fresh vegetables, dairy produce, etc., and light exercise is advised.

P. Harper[5] reports on 38 advanced cases treated in the Fiji asylum at Makogai by intravenous injections of **Chaulmoogra Oil**, with one death from influenzal pneumonia, and with improvement in 70 per cent. F. de Mello[6] reports on twenty-two months' trial of **Sodium Gynocardate A** in 4 to 6 per cent solutions, with 1 per cent **Sodium Citrate**, intravenously, with marked improvement or cure in 9 of 11. The number of bacilli showed a reduction, but he did not find any material alteration in the number of whole and broken-up bacilli. He concludes that the treatment is safe and beneficial. R. G. Archibald[7] reports a case of leprosy treated with **Stibenyl** with considerable improvement. (*See article on* KALA-AZAR regarding the serious toxicity of this drug.) J. N. Roussel[8] reports two cases of leprosy which cleared up and remained well up to two years after injections of 0·25 to 1·05 c.c. of liquid **Anthrax Vaccine** twice a week for one and a half to two months. F. G. Cawston[9] has seen healing of ulcers and improvement in the general health of a few lepers following the intramuscular injection of **Colloidal Antimony.**

H. T. Hollmann[10] reports further on the use of **Ethyl Ester Chaulmoogrates** first prepared for him by Miss Ball in Honolulu, 84 patients treated for from three months to four years having become free from symptoms and bacteria, and discharged from segregation on parole. A careful study showed no relation between the stage of the disease and duration of the treatment and the results obtained, some advanced cases clearing up as quickly as incipient ones; but further time is required before they can be declared cured, although no cases had relapsed at the time of writing, and he rightly advises that the patients should continue under observation and treatment for two years after giving a bacteriologically negative reaction. G. H. Wildish[11] reports on a six-months' trial of antimony in leprosy at the Zululand and Amatikulu Leper Institution, during which there were over 1000 injections of **Oscol Stibium**, 2·5, 3, and 6 c.c. on consecutive days, followed every three weeks by 4·5 and 6 c.c. on consecutive days, or Crookes' **Colloidal Antimony** intramuscularly. In a few cases **Tartar Emetic** was given intravenously with equally good results, while **Ethyl Ester Hydnocarpate** was combined with the antimony with advantage in some of the cases. Although the treatment is still in its early stages, the progress of the cases, especially some advanced ones, points to the efficiency of the combination.

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## LEUKÆMIAS IN CHILDREN. (*See* BLOOD DISEASES IN CHILDREN.)

## LICHEN PLANUS.

*E. Graham Little, M.D., F.R.C.P.*

Thibierge[1] contributes an article on lichen planus, which he prefers—with many of the French school—to call 'lichen of Wilson'. The earlier part of the paper is a good text-book description of the disease, which need not be dealt with here. The personal notes of this veteran dermatologist are more interesting, as when he remarks on the increasing frequency of lichen planus in the last twenty years, a point which the present reviewer has also emphasized elsewhere. He remarks that lichen planus does not recur, recrudescences being regarded as manifestations of an imperfectly cured attack. As long as any element of the disease remains, recrudescence is probable. He has never seen a general eruption of lichen planus in subjects suffering from hypertrophic or atrophic lichen, and suggests that there is 'a sort of autovaccination': but he has never seen evidence to justify the view that the disease is contagious or transmissible. **Arsenic** in adequate doses he regards as the only drug with any tangible influence on the eruption.

Feldman[2] describes lichen planus as occurring in husband and wife at an interval of three and eight months between the first and second contractions. In both the disease was severe in the mouth, scanty on the skin. The author comments on the rarity of instances of familial lichen planus, and suggests, somewhat inconsequently, that his case is an argument for the infectivity of lichen planus.

REFERENCES.—[1]*Med. Press*, 1921, Oct. 26, 339; [2]*Arch. of Dermatol. and Syph.* 1922 May, 584.

## LIPODYSTROPHIA PROGRESSIVA. *Herbert French, M.D., F.R.C.P.*

This is an uncommon disorder, but its features are so distinctive that a knowledge of them will at once lead to diagnosis, and it is possible that a wider-spread knowledge may show that the condition is not so uncommon as it is at present thought to be. Lee Smith[1] gives a good account of the condition, with photographs of his own case (*Fig.* 36). So far, 27 well-defined cases have been published, of which 25 were females and 2 males. The onset is insidious, and occasionally in early life. There may be vague aches and some malaise, but nothing definite. The characteristic feature is a slowly progressive and almost complete disappearance of fat from the subcutaneous tissue of the head, face, neck, upper extremities, and from the trunk as far as the pelvic bones and folds of the groins, where the fat absorption abruptly ends. It is first noticed in the face, and thence gradually creeps downwards to the level of the pelvic bones. In a few cases—chiefly the males—the emaciation remains limited to the face and neck, or to the face, neck, and

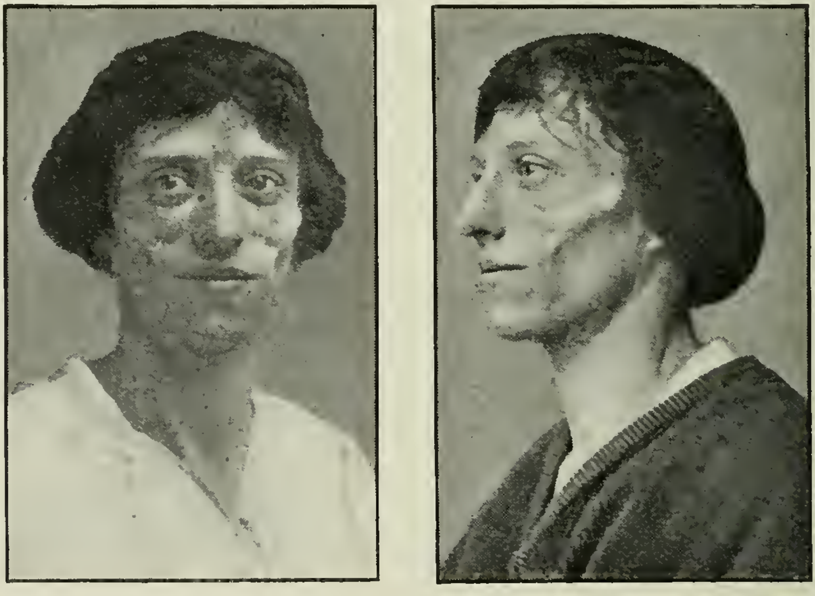

*Fig.* 36.—Lipodystrophia progressiva. Author's patient, age 30 years. Front and side views. Note the furrows produced by smiling, and the malar bones.
*After the illustrations in 'Johns Hopkins Hospital Bulletin*

thorax. The buttocks, thighs, and legs, on the other hand, show an excessive accumulation of subcutaneous fat which makes the picture a very striking one.

The affection is not hereditary and does not endanger life; in fact, there appears to be no interference with the general health and sense of well-being.

REFERENCE.—[1]*Johns Hop. Hosp. Rep.* 1921, Nov., 344.

## LIVER ABSCESS. (*See* AMŒBIASIS.)

## LUNG ABSCESS. (*See also* LUNG SURGERY.)

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

*Bronchoscopy in Diagnosis and Treatment.*—Lynah[1] discusses the bronchoscopic injection of bismuth mixture (bismuth carbonate 1 part, olive oil 2 parts) in the living for the purpose of accurate delimitation of the size and position of the abscess cavity by the *x* rays. The particular bronchial branch communicating with the abscess is first ascertained by inspection while the patient coughs, the abscess is emptied by bronchoscopic suction as far as possible, and then filled with sterile **Bismuth Mixture.** The injection must be made slowly and not under great pressure, otherwise the picture will be spoiled by bismuth lung soaking. The radiographic appearance of the bismuth in the abscess cavity shows a metallic lustre contrasting clearly with the dull opacity shown when it is in the lobar lung structure. Without bismuth injection the radiographic appearances do not distinguish between the actual abscess and the surrounding area of pus-soaked lung tissue.

In addition to being of great service in assisting any surgical procedure that may become necessary, Lynah has found that marked benefit as regards cough, and amount and fœtor of sputum, has followed the injection in the majority of the ten cases so far recorded.

He advocates a thorough trial of **Bronchoscopic Suction Drainage** in all cases of aspiration abscess before resorting to radical surgical measures; he states that it is not practicable to enter the actual abscess cavity, but with the curved spiral cannula it is usually possible to enter that branch of the bronchial tree which leads to the actual abscess. Bronchial dilatations distal to a stricture are not regarded as true abscesses; in such cases the stricture should be dilated.

Of 38 cases of lung abscess treated by bronchoscopy, 9 were due to foreign bodies, 8 followed tonsillectomy, 10 were post-diphtheritic, 2 followed lobar pneumonia, 1 an operation for gall-stones, 1 necrosis of the jaw, 3 were post-influenzal, 2 due to lymphosarcoma, and 2 were the result of inhaling sea-water. Of the 9 definite foreign body cases, 2 died and 7 are alive and well, though one, which followed aspiration of a blade of Timothy grass eight years before, still has purulent expectoration.

Stewart[2] considers that an important factor in the improvement of cases of lung abscess after injection of bismuth mixture is the subsequent exposure to the **X Rays** entailed by repeated röntgenography.

REFERENCES.—[1]*N.Y. Med. Jour.* 1921, July 20, and *Jour. Amer. Med. Assoc.* 1921, Nov. 12; [2]*Amer. Jour. Roentgenol.* 1921, Feb.

## LUNG, GANGRENE OF.

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

Roch[1] reports benefit to a case of lung gangrene, which had resisted all available forms of treatment, from the use of **Tincture of Garlic.** A 20 or 10 per cent tincture is easily prepared by macerating dried garlic bulbs for fourteen days in 95 per cent alcohol. The dose is rapidly increased from 10 to 60 drops thrice daily. In the case reported, improvement was immediate, and within a fortnight the temperature was normal, the sputum was without smell and greatly reduced in amount, there was very little cough, and the patient had gained weight.

REFERENCE.—[1]*Rev. méd. de la Suisse rom.* 1922, Feb.

## LUNG SURGERY.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

*Pulmonary Suppuration.*—Warren[1] discusses the surgery of pulmonary suppuration. The cases, he thinks, fall into three classes: (1) Acute gangrene; (2) Chronic abscess; (3) Cellulitis of the lung. The last is probably the starting-point of the others. In six out of seven cases the abscess or consolidation was situated in the upper part of the lung. This is not the experience of other writers.

Norris and Landis[2] in a series of 132 cases showed a preponderance of abscess in the lower lobes over the middle and upper, and also that the right lung is involved by abscess three times as often as the left. [In three cases of abscess of the lung recently seen by the reviewer, all were in the left lung—two in the lower lobe and one in the upper.—W. I. de C. W.]

When the abscess is in the upper part of the lung, Warren points out that the surgical approach must be through the upper axilla or pectoral region. In discussing operation, he rightly points out that in opening the thorax too widely one may cut outside the area of adhesions usually present, and run the risk of adding an empyema to the original trouble. The adhesions surrounding the abscess and closing off the pleural cavity are often much less extensive than would be expected from the length of history in an individual case. When the lung is not adherent after removal of a rib for exploration, it is better, in most cases, to postpone further operation for a few days. The lung should be sutured to the parietes at the first operation. Warren says that the results of operation may, at first sight, appear gloomy. More than half the cases were fatal; on the other hand, it is highly probable that, without surgical intervention, all the cases would have proved fatal. When in doubt and the patient is not improving, we should remember that the natural course of these cases is progressively downward, and that a delayed operation is often no better than no operation at all. It must not be forgotten that cerebral abscess is a well-recognized complication of chronic suppuration of the lung.

W. S. Lemon[3] has written a valuable paper on abscess of the lung. The patient's hope of recovery depends on the drainage established, either by natural or surgical measures. Acute multiple abscesses cannot drain, and always cause death. Generally speaking, the mortality of patients not operated upon is 50 per cent, and of those operated upon 25 per cent.

REFERENCES.—[1]*Clinical Jour.* 1921, Aug. 24, 539; [2]*Mayo Clinics*, 1920, 1025 [3]*Ibid.* 1022.

## LUNG, TUMOURS OF.

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

Yankauer[1] records two interesting cases of lung tumour **Treated Bronchoscopically.**

The first was a fibroma obstructing the left bronchus, 2 cm. from the bifurcation; this was removed piecemeal with biting forceps, since a snare could not be made to hold; cure resulted.

The second case was an apparent carcinoma of the left bronchus treated with **Radium** emanations (50 to 60 mc.) from a metallic capsule introduced into the bronchus for four to six hours at a time. External applications were made at the same time to the angle of the scapula and the anterior axillary line. Altogether in fifteen weeks the patient received 2000 mc. intrabronchially and 25,000 mc. externally. The radiographs showed considerable improvement, the patient became free from cough and expectoration, he put on weight, and felt perfectly well.

Reference.—[1]*N.Y. Med. Jour.* 1922, June 21.

## LUPUS. (*See also* Skin Tuberculosis.) *E. Graham Little, M.D., F.R.C.P.*

Handley[1] defines lupus as primarily a disease of the lymphatics, a destructive lymphangitis of the parietal lymphatic system. He bases this statement on anatomical observations of the lymphatic system, observations which are personal and offer a new theory of the arrangement of lymphatics in the skin. On this view the skin is divided into independent lymphatic areas, best illustrated by reference to the diagram (*Fig.* 37). From the fascial lymphatic plexus (DDD), which is a unity investing the whole body, discharge is by trunk lymphatics into the cervical, axillary, and inguinal glands. This peculiar lymphatic arrangement explains the nature of advance in lupus, which is similar to that of carcinoma and sarcoma. The area marked BC in the diagram would become infected from AB, not by direct continuity, which is not present, but by the deep fascial plexus, the infection being presumed to descend to that level and ascend again to the skin surface, by the vessels marked FFF. The destruction of lymphatics by the action of lupus explains for the author the peculiar non-malignancy of lupus carcinoma, which is an old clinical observation. The vessels are destroyed by being converted into granulomatous tuberculous masses. This granulation tissue, contracting on the blood-vessels accompanying the lymphatics, produces at first venous stasis, and later arterial, and the phase of clinical lupus differs according as these changes have advanced.

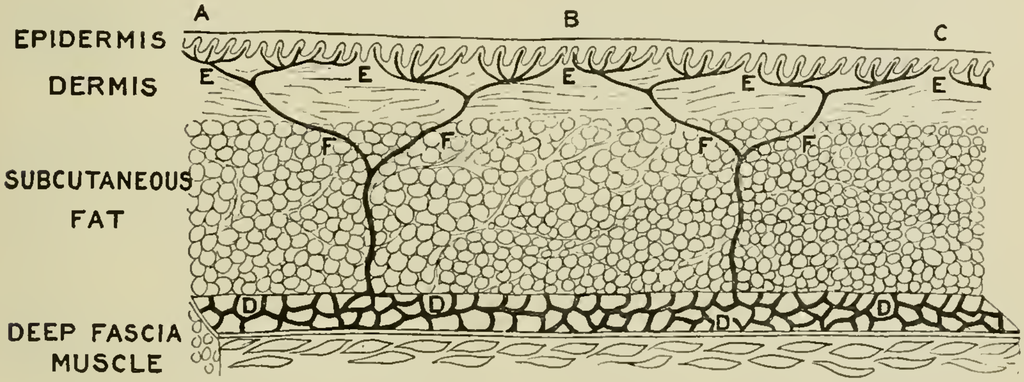

*Fig.* 37.—To show the lymphatic arrangements of the skin. A schematic vertical section of the skin and subcutaneous fat, with a small horizontal shelf of deep fascia projecting forward from it. Below this is muscle in vertical section. AB and BC are two of the primary lymphatic areas of the skin. These areas measure one-third to half an inch in diameter, and the only lymph-vascular communication between them appears to be by way of the subjacent fascial lymphatic plexus DDDD which is seen on the flat. The lymphatic end-sacs of the skin-papillæ unite by groups of five or six to form small lymphatic vessels, which again unite in the superficial third of the dermis (plane of primary confluence EEE) to form other lymphatic vessels, which pierce the dermis vertically and unite just beneath it (plane of secondary confluence FFF) into a smaller number of vessels which run down through the subcutaneous fat to discharge into the fascial lymphatic plexus DDD.

The natural corollary of these findings is that rational treatment of lupus patches bigger than half an inch (this being the average size of a skin lymph area) involves treatment of the deep fascial infection, by **Excision** if possible, by **Radium** when excision is not permissible, since radium may have a certain effect in producing an obliteration of deeper lymphatics and so stopping the channels of infection. Any treatments more superficial than this should be discontinued.

*Disseminated Miliary Lupus and Acnitis.*—Wise and Satenstein[2] give an admirable résumé of the most recent views on these two conditions, with a report of personal cases. Miliary lupus is a true tuberculosis of the skin, commonly appearing on the face and neck as small, bright-red, rounded papules. Diascopic pressure does not always show the buff deposits characteristic of lupus ; but the contents of the papule exhibit the characteristic softness of lupus tissue, and can be readily curetted out. Individual papules may persist for a long time, and may disappear, while fresh lesions develop. Other manifestations of tuberculosis may be present, or this may be the first symptom. Histological examination shows typical tuberculous structure, and true tubercle bacilli have been demonstrated in sections in several cases, animal experiments confirming this diagnosis.

Acnitis, with which the last disease is often confused, is to be distinguished from it on several grounds. The following table sets out differential criteria :—

| Acnitis. | Lupus Disseminatus Faciei. |
|---|---|
| Relatively common | Relatively rare |
| Attacks the face, but is rarely seen on the mucosæ of the lips and the nostrils. There is often a coexisting eruption of 'folliclis' on the upper extremities, and sometimes on the trunk and lower limbs | Almost always limited to the face, with a few lesions on the neck ; predilection for mucosæ of the lips and the nares, and the skin of the eyelids |
| The lesions are papulonecrotic, and usually numerous | The lesions are smooth and shiny ; rarely show tendency to central necrosis. Relatively sparse |
| Apple-jelly colour absent | Apple-jelly colour usually seen |
| Associated acro-asphyxia and perniones of the fingers very common | Absent |
| Coincident eruption of lupus erythematosus, erythema induratum, Darier's sarcoid, etc., often observed | Absent |
| Histologic structure usually that of an ordinary inflammatory reaction. Occasional tuberculoid structure encountered | Histologic structure that of a tuberculoma, usually with central caseation |
| Tubercle bacilli rarely detected | Tubercle bacilli found with relative frequency |

The class name, papulonecrotic tuberculide, includes two chief varieties : acnitis, the deeper-seated disease, and folliclis, more superficial. Acnitis is commoner on the face, folliclis on the hands and extremities. The pathogenesis of this condition is not decisively established, and the direct tuberculous causation favoured by the authors is not universally accepted. The histology is equally indecisive.

References.—[1]*Lancet*, 1921, ii, 1089; [2]*Arch. of Dermatol. and Syph.* 1921, Nov., 586.

## LUPUS ERYTHEMATOSUS. *E. Graham Little, M.D., F.R.C.P.*

Macleod[1] reviews recent work, and re-states the familiar arguments against assigning tubercle as a cause of the disease. The form which occurs as acute spreading eruptions has long been recognized as associated with a toxæmia, and recent views would equally certainly include chronic discoid types as due to the same causes. It is probable that a variety of toxic agencies, and no one specific organism, may produce the disease. General treatment is therefore imperative in addition to local measures, and ought to include regulation of the diet, and avoidance of food and other agencies that cause flushing. In acute cases there is no doubt that retention in bed is necessary. For chronic discoid patches the author considers freezing with **Carbon Dioxide Snow** or **Ionization** the methods of election. Freezing should not exceed fifteen seconds, with medium pressure. Ionization with 2 per cent zinc sulphate lotion, applied with a zinc positive electrode on the skin with a current of 2 to 5 ma. for 15 minutes, is recommended. *X* rays and radium are disappointing, and diathermy seems to offer no advantages over the methods advised above.

REFERENCE.—[1]*Practitioner*, 1922, April, 236.

## MALARIA. (*See also* BLACKWATER FEVER.)

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

ETIOLOGY AND PATHOLOGY.—C. M. Wenyon[1] gives a full account of his war researches on malaria in Macedonia, where the disease was so serious in the army. The principal carriers were the *A. maculipennis* in the low-lying plains and swamps, and *A. superpictus* in the hill streams. In 1916 there were over 30,000 cases of malaria, the numbers rising rapidly with the advance into the deadly Struma valley in July and August. The disease was still more prevalent in September and October, 1917, owing to the submarines preventing evacuation of the affected men, but was largely controlled in 1918 by prompt removal of the infected. Anti-mosquito measures failed owing to their impracticability under war conditions, the mosquitoes being carried up to a mile on a gentle breeze, and prophylactic quinine was also disappointing, possibly on account of the frequency and intensity of the infections; but the writer thinks that mosquito nets during the later stages of the war did much to lessen malaria, and were required from April to November. When the Army moved into Turkey in 1919, some groups of men not taking prophylactic quinine became rapidly and universally infected, indicating that some reduction had resulted from that measure in Macedonia. Work on the mosquito carriers showed that some of the insects hibernate through the winter, and the larvæ can even survive being frozen, while the adult forms live in houses and cattle-sheds, and may even show partial development of the malarial parasites, which may possibly complete their development in the following spring. *A. maculipennis* increases rapidly in the plains about two months earlier, and continues later, than *A. superpictus* does in the hills, which explains the much greater prevalence of malaria in the low-lying areas. In the spring nearly all the infections are benign tertians, while the malignant tertians reach their maximum in September and October, and in the winter months relapses of benign tertians greatly predominate (as in India).

W. A. Kop[2] has studied both differential leucocyte counts and the Arneth count in malaria, and found little tendency to increase of the true large mononuclears if large lymphocytes were excluded; but a well-marked shift of the Arneth count to the left was present in fifteen cases of malaria, while those which relapsed showed a persistence of this change, or a decline followed by a fresh rise before a relapse of the malarial fever occurred. He therefore considers it of importance as a sign that a case is not completely cured. Newham and Duncan[3] also found a shift of the Arneth count to the left in six cases of malaria, followed by a rapid change towards the normal under quinine treatment. Benhamou, Jahier, and Berthélemy[4] record estimations of the urea per litre of blood in malaria, which becomes increased during the febrile paroxysm, while in pernicious cases it was found to rise enormously to from 0·27 to 0·52 grm. in favourable cases and from 2 to 3·6 grm. in fatal ones, being thus of great prognostic importance. A. Castellani and J. G. Willmore[5] and G. A. Harrison[6] each describe a case of glycosuria which they believe to have been of malarial origin.

K. McLay,[7] in laboratory work in Mesopotamia, found **Oral Quinine** more effective than intramuscular injections in reducing the malarial parasites in the blood, which is in accordance with its more rapid excretion in the urine on oral use. Intramuscular injections caused pain, leucocytosis, and sometimes fever, apart from the presence of parasites in the blood, and therefore should be reserved for cases in which the oral route is impossible. Four-hourly counts of the parasites showed the drug to have an immediate effect on the intracorpuscular stage as well as on sporulating merozoites. In cultures of the parasites they collected around large mononuclear leucocytes. A. Macdonald[8] looks on the absence of enlargement of the spleen, with 75 or more per cent of hæmoglobin and good general condition, as evidence of the fitness of a malarial patient to return to duty. A. B. Fry[9] finds in Bengal that cattle in sheds near human dwelling-houses may afford some protection against malaria by attracting the anopheles to the cattle, on whom they may feed exclusively, and suggests placing a ring of cattle sheds between a village and surrounding malarial swamps. J. Tait[10] draws attention to the fact that Indian-ink particles injected into the circulation collect exclusively in the spleen, liver, and bone-marrow within an hour or two, just as malarial pigment does, and he points out that resulting pain over the bones and spleen may be of diagnostic value.

R. E. I. Johnson[11] observed in Colombo that attacks of dengue fever in malarial subjects may be followed by cessation of the malarial recurrence. R. W. Mendelson[12] records a case of malarial polyneuritis in which the nerve signs came on within a few days of the attack of malaria. E. Wilkinson[13] reports a case of subtertian malaria in an English port, which was at first suspected to be yellow fever. W. A. Mulherin and F. X. Mulherin[14] record observations on malaria in infancy in the United States, and point out that the patients may show little fever, with a frequent absence of the typical periodicity, making cases in children under three years of age liable to be overlooked.

T. S. Hele[15] records chemical investigations on the excretion of quinine in malarial cases in Macedonia, and found it to be very similar to that previously found in health ; he observed no constant differences under different forms of therapy. In blackwater fever the excretion was little less than normal in five cases, under half the normal in one, while in a fatal case with suppression of urine, that obtained from the bladder after death showed only traces of quinine ; 40 mgrm. were recovered from the liver. Genevrier[16] advises three intravenous injections of quinine hydrochloride in a 1–20 solution in doses of 1·2 to 1·4 grm. on alternate days, together with 1-grm. doses orally on the intermediate days and subsequently, to sterilize the blood of malarial patients quickly.

Treatment.—Wenyon[1] advises a full oral course of **Quinine** followed by moderate week-end doses, while intramuscular injections for one or two days only may sometimes be useful in resistant cases. Ronald Ross[17] deals with the principle of repeated medication for curing malaria and other protozoal infections, and points out that the omission of the drug for a day or two will undo the good accomplished by the previous week to ten days' treatment, while after the first course of full doses 10 gr. a day (5 gr. are useless) for three months will cure most cases. [The writer, in his *Fevers in the Tropics* of 1908, recommended a three-months' course in all malarial cases.—L. R.]. A leading article in the *Indian Medical Gazette*[18] discusses the question, "Is quinine a failure, in the light of harmful statements in the lay press in India?" It points out fallacies due to insufficient doses, unreliable dispensing owing to the drug being stolen by subordinates, etc. F. Lomax Wood[19] recommends 7 to 8 min. of **Liq. Adrenalin Hydrochloride** in 2 oz. of water for the vomiting of malaria. A. G. Anderson[20] records careful tests of various methods of administering quinine in producing freedom from relapses in Macedonia, and shows that different methods all gave freedom in from 28 to 41 per cent only in cases admitted before July during the seasonal increase of malaria—nearly all of the benign tertian form—but was successful in 64 to 82 per cent of cases treated after July 1 during the natural decline of malaria, although the control figures were 23·6 and 37·1 per cent in the two series. Slightly better results were obtained by a short intensive oral quinine course followed by 30 gr. on two successive days weekly for eight weeks. V. S. Hodson[21] finds quinine only partially successful in the Sudan unless any associated helminthic infections are removed.

References.—[1]*Jour. R.A.M.C.* 1921, Aug., 82; [2]*Jour. Trop. Med. and Hygiene,* 1921, 279; [3]*Ibid.* 1921, 301; [4]*Presse méd.* 1921, 912; [5]*Brit. Med. Jour.* 1921, ii, 286; [6]*Ibid.* 630; [7]*Jour. R.A.M.C.* 1922, 93; [8]*Ibid.* 131; [9]*Ind. Med. Gaz.* 1922, 1; [10]*Canad. Med. Assoc. Jour.* 1922, 134; [11]*Jour. Trop. Med. and Hygiene,* 1922, 111; [12]*Ibid.* 139; [13]*Lancet,* 1922, i, 846; [14]*Jour. Amer. Med. Assoc.* 1922, i, 1873; [15]*Jour. R.A.M.C.* 1922, 251; [16]*Presse méd.* 1922, May 20, 431; [17]*Brit. Med. Jour.* 1921, ii, 1; [18]*Ind. Med. Gaz.* 1921, 461; [19]*Practitioner,* 1921, 443; [20]*Jour. R.A.M.C.* 1922; [21]*Jour. Trop. Med. and Hygiene,* 1922, 18.

## MALTA FEVER (Undulant Fever).

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Prophylaxis.—T. Zammit[1] reports on the results of preventive measures against undulant fever since the establishment of the mode of infection through goat's milk, and steps taken to prevent such milk being used unboiled in Malta, in 1906. The immediate almost complete disappearance of the disease among the British naval and military forces following this measure proved its value, the rate per 1000 in the Navy falling from 17·0 to 22·2 between 1900 and 1905, to from 1·3 to 0·2 between 1907 and 1914; and in the Army from 77·5 to 17·7 in the earlier period to 1·9 to 0 in the latter, according to J. W. W. Stephens.[2] On the other hand, among the civil population of Malta the earlier rate was from 4·0 to 2·4, and since 1907 it has been from 2·7 to 1·2, which small decrease Zammit attributes to the native population refusing to follow the advice of the sanitary authorities to boil all goat's milk before consumption. Steps are being taken to examine as many goats as possible and to destroy the infected ones after compensating the owners; but the sanitary staff has not been able to deal with more than one-third of the animals in any year, so progress in stamping out the disease by this measure has been slow. Bassett-Smith[3] has also dealt with similar figures in a lecture on the disease.

Treatment.—A. Carini[4] records a preliminary account of experiments on the antibacterial and antitoxic substance, Piazza's **Phenololipoid N.,** on the *M. melitensis* both *in vitro* and in guinea-pigs, and found that a 1–10 to 1–20 solution killed the organism in fifteen minutes, and down to 1–1000 solutions in longer periods of time *in vitro,* while most of the animals could be cured by the treatment with daily subcutaneous injections of the preparation.

References.—[1]*Ann. Trop. Med. and Parasitol.* 1922, March, 1; [2]*Ibid.* 11; [3]*Jour. Trop. Med. and Hygiene,* 1921, 173; [4]*Ibid.* 1922, 1.

## MASTOID DISEASE. (*See* Ear.)

## MATERNITY AND CHILD WELFARE. (*See also* Milk Supplies, Pure; Public Health Administration.)

*Joseph Priestley, B.A., M.D., D.P.H.*

For the present, in Government departments, economy takes precedence over public health. Economy comes first—financial economy; but is it true economy, if the health of the rising generation suffers in consequence? However, it is clear that the difficulty must be faced, and, for the present and for a few years to come, maternity and child welfare committees will have to content themselves with marking time, and doing the best they can under strict economical methods. What used to be known as the beneficent and generous fertilization of maternity and child welfare work by the judicious application of Government grants will be, in fact is being, much reduced, and the fertilization *pro rata* arrested. Future statistics of the Registrar General will, it is to be feared, show the natural result of such a change of policy in the form of a higher infantile mortality and morbidity and a lessening of the vigour of young children generally.

Milk assistance schemes will suffer by the income limits being reduced, thus preventing many 'necessitous' cases (mothers and children) being dealt with. This brings up again the subject as to what is meant by a 'necessitous' case ? Does it mean a mother or a child who is in a 'necessitous' condition—i.e., using the adjective in its Poor-Law sense ? Or does it mean a mother or a child for whom milk is a *necessity* as an extra or adjunct food to the ordinary dietary ? The latter definition is the more generous, and, if acted upon, will show the better results. Hundreds and thousands of mothers and children require this extra or adjunct food in the form of milk so as to supplement the daily dietary. The daily household expenses will not admit of this extra luxury, and the State should come to the rescue of local authorities. With the cost of living as at present, with wages going down, it is practically impossible to save out of a working-class daily or weekly budget even the few extra pennies or shillings required for milk: and yet this milk proves invaluable in making all the difference between children who are just balancing 'intake' and 'output' and those who have extra 'intake' and to spare. The child's physique, the child's rosy cheeks and healthy-looking skin, stand out in the latter cases in marked contrast, a valuable return for the extra food (in the form of easily-digested milk) distributed under milk assistance schemes. What applies to the children applies also to the mothers, whether expectant or nursing. Bad teeth and unsuitable ordinary food prevent the human furnace getting the maximum value out of the fuel consumed : hence the necessity for an extra or adjunct food so easily digested as milk. Physiological facts should take precedence over economical considerations, if the healths of the mothers and the children are to be preserved. The same statement may be made in regard to school children, users of milk getting through the educational standards of work more quickly than non-users (according to American statistics).

So important is the subject of maternity and child welfare that the British Medical Association appointed a strong and representative committee (representative of all well-known associations engaged in similar work), and that committee has issued a lengthy report, the conclusions arrived at being worth tabulation for future reference, as showing where the general practitioner comes in, or should come in, in connection with welfare schemes. The conclusions of the Committee are as follows :—

1. Maternity and child welfare work has contributed in an appreciable degree to the reduction of infant mortality that has taken place, but it is too early to determine to what extent it has been effective.

2. The effect of many of the causes of infant mortality can be lessened by the education of women at centres and in their homes.

3. The educational work amongst the mothers on the racial poisons (alcohol, syphilis, and tubercle), and on the influence on infant mortality of pollution of the air by smoke and other impurities with the consequent deprivation of sunlight, should be encouraged and extended.

4. The instruction of the elder girls at school in homecraft and mothercraft should be developed and encouraged.

5. Every effort should be made to improve the economic position and prospects of midwives and midwifery nurses ; and encouragement should be given to them by local authorities wherever there is difficulty in securing a sufficient supply.

6. The provision of sufficient hospital accommodation for diseases of pregnancy and difficult confinements, and maternity homes for normal confinements which cannot conveniently be conducted in the patients' homes, should be made general as soon as possible.

7. The primary and main object of maternity and child welfare centres should be educational, preventive, and advisory; no treatment should be given for conditions which, in the absence of the centre, would be recognized as calling for the attendance of a medical practitioner ; it is against the best interests of the centres to encourage women to go to the centre for what they can *get* rather than for what they can *learn.*

8. There are advantages to the work in associating with the centres a body of voluntary workers; but the whole of the work should be under the control of the medical officer of health, in order that all the preventive agencies may be co-ordinated.

9. The support of the local doctors, nurses, and midwives can and ought to be secured. This can be done (*a*) if it is made quite clear that the sphere of the centres is restricted as recommended above, and (*b*) if members of these professions are represented on the statutory committee and the committees controlling the centres, these representatives being nominated by the local organizations of these professions wherever such exist.

10. The experience of the 'family doctor' would be useful in the work at the centres ; but practitioners accepting the appointments must have knowledge of, and a real interest in, the work; the appointment should be for a long enough time to be administratively convenient ; and those appointed should clearly realize that, in accepting the post, they must undertake to carry on the work irrespective of other claims on their time.

11. For every mother, and child up to five years of age, there should be available domiciliary attendance by a family doctor.

12. In order that medical practitioners should be fully equipped for maternity and child welfare work, it is desirable that the medical student should be educated in, and be encouraged in the practice of, duties in relation to (*a*) personal and domestic hygiene, and (*b*) industrial hygiene and other spheres of preventive medicine.

## MEASLES. (*See also* EYE AFFECTIONS.) *J. D. Rolleston, M.D.*

BACTERIOLOGY.—A. W. Sellards and G. H. Bigelow[1] isolated a small pleomorphic Gram-staining bacillus from the blood in 25 out of 31 cases of measles. It was sometimes found in considerable numbers, growth occurring in one instance after inoculation of 0·01 c.c. of blood. Similar cultures in 24 controls resulted in growth in 5 cases. Three monkeys were inoculated with strains from measles cases. In two the symptoms were vague, consisting merely in a diffuse erythema and isolated papules. In one, however, a suggestive cluster of macules and papules developed, some of which became petechial. Histologically the lesions resembled those found in the human subject.

PATHOLOGY.—R. Kawamura[2] was able to produce typical measles in three monkeys (*M. fuscatus*) by subcutaneous injection of blood taken from a measles patient sixty hours before the appearance of the eruption and only a few hours after the onset of fever. There was a definite incubation period of seven to nine days, with slight fever, conjunctivitis, rhinitis, roseolar eruption, Koplik's spots, and leucopenia. There was no leucocytosis at any time. The histological lesions corresponded to those found in human measles. Kawamura was able to obtain positive results for three generations from the infected animal by inoculation. Inoculations of rabbits and guinea-pigs, however, were negative.

Epidemiology.—P. M. Stimson[3] states that from October, 1919, to May, 1920, there were about a third more cases of measles reported on Manhattan Island or in New York City proper than of all the other contagious diseases combined. Diphtheria, scarlet fever, mumps, whooping-cough, varicella, and rubella altogether totalled only 11,725 cases, whereas 15,481 cases of measles were reported. The following recent figures from the New York City Department of Health are quoted by Stimson, illustrating the ages of the patients and mortality from measles. Of over 6000 cases, just half occurred in the school years 5–14; only 2 per cent occurred in older people, while the remaining 48 per cent were in infants and children of the pre-school period. Yet of the deaths from measles in New York City in 1919, 95 per cent were in children 4 years old and under, although less than half of the cases occurred in children of that age. Under ordinary circumstances, therefore, the longer a child lives before contracting the disease, the greater are his chances of recovery.

Symptoms and Complications.—In a paper published many years ago on the *prodromal rashes* of measles (*see* Medical Annual, 1906, p. 319), the reviewer emphasized their early appearance, transient nature, tendency to be localized, capricious distribution, polymorphism, absence of local irritation, and great diagnostic value. In a recent paper, F. J. Nöthen,[4] who confirms these observations, remarks that prodromal rashes are relatively common in certain epidemics, but as a rule are infrequent. Like the reviewer, he found them relatively frequent in measles developing in convalescence from scarlet fever.

M. Salzmann[5] has collected 36 cases from literature of *repeated attacks* of measles, in which each attack was seen by the same observer, and draws the following conclusions from a study of these cases: (1) The relative frequency of three or more attacks; Salzmann was able to find 21 examples of third attacks on record, and 2 of a fourth attack. (2) The frequency of a second or third attack occurring in several members of the same family. (3) The absence of anything characteristic in the prodromes, symptoms, course, or termination of a second attack of measles. [Although the reviewer has seen many cases of measles with a history of a previous attack, he has never witnessed two attacks in the same individual. It is highly probable that in a large proportion at least of supposed cases of repeated attacks of measles the eruption on one or other occasion was either rubella or was of a non-specific character.—J.D.R.]

Under the name of *morbilli bullosi* E. Morton[6] reports a case in a girl, age 7½ years, who, after a prodromal stage of three days in which the symptoms were headache and discharge from the eyes, developed a rash resembling measles on the trunk and limbs. The following day a bullous eruption appeared on the chest and rapidly spread to other parts of the body. Death took place on the seventh day of disease. Apart from bronchopneumonia of the right lung, nothing abnormal was discovered at the autopsy. The case closely resembles that recently recorded by Neff (*see* Medical Annual, 1921, p. 306). Two cases of bullous eruption in measles have also recently been reported by J. R. Burdick[7] in twin infants 10 months old.

M. Renaud[8] draws attention to the frequency and importance of *lesions of the ear and brain* in fatal cases of measles. In the course of 1921 he treated 148 cases of measles, of which 122 or 82 per cent were mild, 10 or 6·7 per cent were fatal, and 16 or 11 per cent were severe but recovered. In 7 at least of the 10 fatal cases—in the other 3 a special examination was not made—otitis and cerebral infection were responsible for death. As a general rule the forms with suppurative otitis were the most prolonged and severe, whereas the pulmonary lesions in all the cases yielded very readily to treatment. Renaud concludes that, owing to the structure of the ear and its connections with the brain, otitis is a more serious complication of measles than any pulmonary affection.

E. Thorp[9] reports a case of *gangrene of the leg* which occurred on the eleventh day of measles complicated by bronchopneumonia in a girl of 4½ years. Death took place on the fifteenth day. There was no autopsy.

E. H. Kelly[10] records a case of *purpura fulminans* following measles complicated by bronchopneumonia in an infant, age 17 months, death occurring seventeen hours after the first appearance of the eruption without any hæmorrhages from the mucous membranes. Although a large proportion of cases of purpura fulminans have followed scarlet fever (*see* SCARLET FEVER), only two previous examples have been reported after measles.

In view of the variety of nervous complications in measles (*see* MEDICAL ANNUAL, 1908, p. 372 ; 1920, p. 306), special interest attaches to the case reported by C. R. Box[11] in a girl of 14 who developed *acute ascending paralysis* four days after the appearance of the eruption. Recovery took place. Box regarded the cord inflammation as either toxæmic or infective in character, and from the dissociated nature of the accompanying anæsthesia considered that the lesion was situated in the central grey matter. He alludes to the case reported many years ago by Sir Thomas Barlow in which disseminated myelitis was found in a fatal case of measles.

PROPHYLAXIS.—The prophylactic injection of **Convalescents' Serum,** a method first introduced by Nicolle and Conseil and Richardson and Connor (*see* MEDICAL ANNUAL, 1919, p. 229), and since employed on a large scale by Degkwitz (*Ibid.*, 1921, 307 ; 1922, 262), has recently been extensively employed in Germany,[12] as well as by Nobécourt and Paraf[13] in France, Maggiore[14] in Italy, and McNeal[15] in America. The method appears to have been invariably successful and not to be attended by any risk, provided care be taken to chose donors who are free from syphilis or tuberculosis. The only drawback to the method is that donors may not be available, especially as many parents may object to their children being used for this purpose. To remedy this defect, Degkwitz recommends that special serum centres should be established in municipal hospitals where the serum of measles convalescents could be provided for use in kindergartens and infant homes.

The method employed by H. Hiraishi and K. Okamoto[16] differs from that just described in that the blood was taken not from convalescents but from measles patients between the first appearance of Koplik's spots and the height of the eruption. The second inoculation was made as a rule three weeks after the first. This method does not appear to have been as successful as the use of convalescent serum, as several cases developed measles four weeks after inoculation, although the attack was very mild.

TREATMENT.—The administration of **Calcium Sulphide** in ½-gr. doses is recommended by E. Rice,[17] who found that it caused prompt relief of the catarrhal symptoms and cutaneous irritation, shortened the course of the disease, lessened the severity of the symptoms, lowered the temperature, and reduced the liability to complications and sequelæ.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1921, i, 318 ; [2]*Japan Med. World*, 1922, 31 ; [3]*Arch. of Pediatrics*, 1922, 11 ; [4]*Jahrb. f. Kinderh.* 1922, 211 ; [5]*Med. Science*, 1922, v, 486 ; [6]*Brit. Jour. Child. Dis.*, 1921, 188 ; [7]*Jour. Amer. Med. Assoc.* 1922, i, 1085 ; [8]*Bull. Soc. méd. Hôp. de Paris*, 1922, 693 ; [9]*Lancet*, 1921, ii, 754 ; [10]*Brit. Jour. Child. Dis.* 1922, 86 ; [11]*Lancet*, 1921, i, 222 ; [12]*Med. Science*, 1922, v, 488 ; [13]*Presse méd.* 1922, 497 ; [14]*Jour. Amer. Med. Assoc.* 1921, ii, 1773 ; [15]*Ibid.* 1922, i, 78. ; [16]*Japan Med. World*, 1921, 10 ; [17]*Med. Record*, 1921, ii, 592.

## MEDICO-LEGAL POINTS OF INTEREST. (*See also* PROFESSIONAL SECRECY IN MEDICAL PRACTICE).

*Joseph Priestley, B.A., M.D., D.P.H.*

*Specific Precipitin Test for Human Semen.*—The injection of rabbits with human semen induces the formation of precipitins that are specific for human seminal proteins, and this precipitin reaction may prove of value in determining the nature of spots suspected to be of seminal nature.

*Value of Juries.*—On March 1, 1923, the Juries Act 1918 becomes inoperative, and the power of coroners to sit in a large number of cases without juries will cease. There is much to be said for and against the 'jury system'—not only as far as coroners' courts, but also all other courts, are concerned. In the multitude of councillors there is wisdom. This is a statement that may be true as far as Parliament and public bodies are concerned, but the same argument does not, necessarily, apply to a court of law or even to a coroner's court, where the cases are technical and dependent upon expert evidence (chiefly medical and scientific), requiring a judicial brain to interpret such evidence. Is the ordinary juryman or jurywoman capable of doing so? With regard to medical evidence or semi-medical evidence, the answer is easily given—certainly not.

All are agreed that during the war, when juries had to be more or less dispensed with owing to the want of man-power, justice does not appear to have suffered; on the contrary, it has been as competently administered as before the war. Still, it is difficult to conceive of the British Isles without their 'jury system', the palladium of British liberty. Why is it that a prisoner, who has a 'doubtful' case, always elects, or is advised by his legal advisers, to apply for a jury? Is it because the prisoner does not want a *fair* trial? If the discussions that take place when the jury retires to consider the verdict could only be made public, 'trial by jury' would cease to be the vogue. As showing how the official wind is blowing, the Home Secretary has stated in the House of Commons recently that it is intended to introduce a bill to deal with the holding of coroners' inquests without juries. The decision of Parliament will be interesting. The Bill may become an Act under the camouflage of 'economy'.

*Dying Declarations.*—A statement made by a dying person will only be admitted as evidence if it can be proved to have been made "with a settled hopeless expectation of imminent death"—the word "imminent" to be construed reasonably, and not necessarily to have reference to a question of twenty-four hours. The statement is better if put into writing and signed by the person concerned and a witness or witnesses, but a signed, written, witnessed statement is not necessary.

## MENINGITIS.

*J. Ramsay Hunt, M.D.*

*Serous Meningitis.*—Yates[1] describes a number of cases and discusses the symptomatology. Serous meningitis was first described by Quincke in 1893, and many cases have since been reported; but the condition does not appear to have received the general attention it deserves. Pathologically, the essential condition is an increase in the intracranial pressure due to an excess of cerebrospinal fluid, produced not so much by mechanical obstruction—though the latter may be a factor in certain cases, as when the foramina in the roof of the fourth ventricle are blocked by exudate or old thickening—as by an inflammation of the meninges and ependymal lining of the ventricles, which never passes beyond the serous stage. The ventricles are usually distended with clear fluid, but in some instances the fluid is mainly in the subarachnoid space, and there may be definitely localized collections at the base or elsewhere.

Excluding grossly obstructive cases, such as those due to tumour or obliteration of the large sinuses, cases due to tubercle and syphilis, and non-inflammatory cases secondary to cardiac and renal disease, there still remains a group, acute and chronic, of which a non-purulent inflammatory effusion is the essential feature. Associated with the serous effusion a variety of conditions have been described. Quincke found the ependyma thickened, and in some cases granular. Merle described inflammatory changes in the meninges and choroid plexus as well as in the ependyma, but he maintained that the last was the most frequent and the most important. In some cases an encephalitis was found in addition, and other conditions described include obliteration of the aqueduct of Sylvius and of the foramina of Monro, and adhesions isolating some part of the ventricular cavity.

Joel described a case secondary to a fœtid discharge from the left ear, which was at first thought to be an extradural abscess ; but the only condition found at operation was œdema of the meninges and brain tissue, which recovered completely. W. B. Warrington, in a case secondary to a left-sided otitis, found merely increased fluid and congestion of the meninges which cleared up completely. In another case he described thickening of the floor of the fourth ventricle by granulation tissue. Nonne recorded two cases, one following injury in which nothing was found except great dilatation of the ventricles, and the other apparently due to mental shock, in which there was hydrocephalus with fresh granulations in the ependyma. Other writers have described similar conditions and microscopically perivascular infiltration, and in cases of longer standing fibrosis has been found in the ependyma and pia-arachnoid.

It is evident that such conditions may lead, on the one hand to increased production, and on the other to defective absorption, of the cerebrospinal fluid, and in this way bring about an internal hydrocephalus which is clinically the essential feature of the disease. This group of cases is thus of very varying etiology, and consists of cases of serous effusion within the skull, analogous to a serous effusion in the pleura or pericardium. It brings into line cases of infantile hydrocephalus which are probably at the outset inflammatory, cases of chronic internal hydrocephalus in the adult—which often simulate an intracranial tumour—and the more acute cases which may simulate such conditions as purulent meningitis, cerebral abscess, and sinus thrombosis. The most characteristic symptoms are those of cerebral compression, headache, optic neuritis, vomiting, slow pulse, and altered mentality. The onset may be abrupt or gradual, and in the acute cases there is sometimes fever. Somnolence is frequent, and there is sometimes coma. Diplopia, strabismus, and nystagmus are frequently found. Nystagmus is probably due in otitic cases to disease of the labyrinth, and the diplopia to paresis of the external recti. Symptoms referable to more localized interference with cerebral function occur in some cases, such as monoplegia, hemiplegia, and Jacksonian attacks. The knee- and ankle-jerks are often diminished and sometimes absent. Cervical rigidity is also of frequent occurrence ; it is usually slight, and unaccompanied by retraction of the head. On lumbar puncture the cerebrospinal fluid is clear, under considerably increased pressure, and usually sterile. On chemical and cytological examination it is often normal ; but there may be a lymphocytosis, an increase in protein content, and an absence of the normal reduction of Fehling's solution. Variability in the severity of symptoms from time to time is frequently observed, a fact of some value in diagnosis.

The prognosis of the acute cases is much more favourable than that of the other acute conditions which lead to an increased intracranial pressure, and many recorded cases have recovered. The first essential in treatment is to find the primary source of infection and to deal with it in the most appropriate manner. The free drainage of pus from the temporal bone may be all that is needed to bring about the rapid disappearance of all cerebral symptoms.

If the intracranial pressure does not quickly subside, steps should be taken to relieve it, and in the more acute cases this can be most readily done by **Lumbar Puncture,** a procedure which is also of the greatest possible value in diagnosis. When serous meningitis is the only intracranial lesion present, it is not, as a rule, necessary to open the dura. In the more chronic cases, however, which may closely simulate a cerebral tumour—a condition in which lumbar puncture is known to be dangerous—greater caution is desirable ; until the diagnosis can be placed upon a surer footing, it is a wise rule to refrain from lumbar puncture, and to resort to decompression in cases where a tumour cannot with reasonable certainty be excluded, and probably also in those where epileptiform convulsions with unconsciousness have occurred.

The advisability of **Laminectomy** with free spinal drainage in certain classes of meningitis is considered by Roland Hill.[2] While no principle in surgery is more deservedly recognized than that of establishing an ample outlet for purulent inflammatory products, still in the cerebral and spinal inflammations we have special and very vital factors to be considered. Acute meningitis, especially when of streptococcus or staphylococcus origin, is a very fatal disease. Death is the result of two factors : increased intracranial tension and toxæmia. The first factor can be influenced by lessening the cerebrospinal fluid by means of lumbar puncture or by the establishment of open drainage. The factor of toxæmia may possibly be influenced by the dilution of the toxins through the rapid secretion of cerebrospinal fluid.

The principal objection to laminectomy along with the operation of cerebral decompression has been made by Cushing. The objection raised is that purulent products in the base of the skull are sooner or later blocked off, thus rendering a spinal opening useless. Hill has operated on two cases of meningitis, with one recovery and one death. He believes cases of meningitis from streptococcus or staphylococcus should be operated. Whether or not it will be found advisable in those cases of meningitis following influenza seems an open question.

Recovery has followed repeated spinal puncture, and it seems only rational that laminectomy should yield infinitely better results than spinal puncture if done before the cerebrospinal channels are blocked by inflammatory products or adhesions.

Sharp[3] states that **Injection of Air or Oxygen** into the ventricles of the brain has become a recognized procedure in neurological and surgical diagnosis. Injection into the subarachnoid space by lumbar puncture, producing an artificial pneumorachis, has also been found of value in acute infection of the meninges. During an epidemic of meningococcus meningitis in 1916–17, a few cases occurred in which the purulent fluid was obtained with difficulty owing to adhesions or blocking of the vertebral canal. Injections of half-strength normal saline diluted the fluid and broke down adhesions, permitting a free flow of the purulent fluid. In some of these cases oxygen was injected and an additional quantity of purulent fluid was evacuated before injection of antimeningococcal serum, the oxygen in such cases probably acting only as a mechanical agent in displacing the fluid and opening up secluded pockets of adhesions, and not possessing any germicidal action. The average amount of oxygen introduced was from 10 to 15 c.c. No bad effects have ever resulted. During the last four years Sharp had treated 64 cases by this method ; 30 were cases of meningococcus meningitis, of which 23 recovered and 7 died; 12 tuberculous meningitis, of whom 3 recovered and 9 died; 10 lethargic encephalitis, of whom 8 recovered and 2 died; 2 anterior poliomyelitis, which both recovered; and 10 pneumococcus, streptococcus, or typhoid meningitis, which were all fatal.

REFERENCES.—[1]*Lancet*, 1921, ii, 1271; [2]*Surg. Gynecol. and Obst.* 1921, Sept., 288: [3]*Lancet*, 1921, ii, 1337.

## MENTAL DISEASE. (*See also* PSYCHOLOGICAL MEDICINE.)

*C. Stanford Read, M.D.*

The outstanding feature in psychiatric advance during the past twelve months has undoubtedly been the inauguration in England of a National Council of Mental Hygiene, following similar movements in America, Canada, and France. Though economical factors will preclude adequate activity for some time, its inception demonstrates the greatly increased interest taken in this branch of medicine, and augurs well for the future development of our too meagre knowledge of mental disease and the practical application of what we have already learnt. The excellent work done in late years by a like organization in the United States plainly proves the necessity for concerted action by such a body. Not only does the laity urgently require education on matters pertaining to mental disease, but even our own profession sadly lacks an understanding of its essential factors. That the immediate object of societies for mental hygiene should be to educate is insisted by Emerson,[1] who bluntly states that the average citizen must see clearly that mental disease is disease, and that the patient needs a hospital and expert care and not a gaol. In the hospitalization of mental patients the safety of the public alone has been considered, and not the welfare of the patients. This viewpoint is gaining rapidly on the part of all concerned. Professor Robertson, in his presidential address to the Medico-Psychological Association,[2] makes a like plea, and dilates upon the drawbacks to our present asylum system and the radical changes in Scottish administration past and looked for. Though for manifold reasons any ideal clinic can hardly be set up at present, the outline of some such organization has been put forward by Helen Boyle,[3] and discussed at some length by leading psychiatrists. Excellent out-patient work has been accomplished at the clinics under the Ministry of Pensions, but it has been patent that the benefit accruing is handicapped by the lack of trained social service workers. A knowledge of some of the American work[4] done on these lines will amply confirm such a want.

Reference was made last year in these pages to the question of *nomenclature*, and it is important to protest against the euphemistic way in which mental disorders, not patently certifiable as insane, are spoken of as 'nervous breakdown' and 'nervous exhaustion'. Such terms imply a false pathology, since in the vast majority of instances nerves or exhaustion are not notable factors, and their acceptance by patient and doctor leads to a therapy which is unavailing and harmful. Even in some modern literature we see a tendency to trace a hypothetical nervous exhaustion as the source of all morbid mental phenomena. Both patient and physician must recognize that the majority of these states are purely mental, requiring a mental therapy, and only by such means will progress be made and the stigma of mental disease gradually lessened. Sherrington, in his presidential address at the British Association, in discussing the mechanism of the mind, states that "to pass from a nerve impulse to a psychical event, a sense impression, percept, or emotion is, as it were, to step from one world to another and incommensurable one", and says there is "no need to stress our inability at present to deal with mental actions in terms of nervous actions, or vice versa". Millais Culpin[5] has wisely drawn attention to many of these points, and suggests more scientific technical expressions.

The psychogenic and physiogenic aspects of mental disease continue to divide psychiatrists into separate camps, though there are evident signs that the psychological factors are gaining added allegiance, and a greater attempt at a correlation of the two viewpoints is being made. This latter is aided by the discovery of the part played in the organism by the *internal secretions*, and, as will be seen later by quoted literature, the rôle of endocrine disturbance is greedily accepted as a probable source of much mental disorder. That the study of endocrinology will in time bear fruit in psychiatry seems certain ; but at present, except in a few definite conditions, our knowledge of it is far too meagre to allow any conclusion except of a highly speculative nature. There is also much more evidence that an emotional stimulus is provocative of hormone imbalance, and that this latter is not usually primary. Stoddart[6] endeavours to show that endocrinoses are usually secondary to psychical disturbances, and not primary, and though he realizes that his remarks mostly apply to anxiety-hysteria, he thinks that many cases found in asylums and regarded as melancholia are really anxiety-hysteria. In his critical examination of current views on internal secretion, Swale Vincent[7] says that if the subject of internal secretion, in both its clinical and its physiological aspects, is not to fall into utter disrepute, it must be treated with infinitely more scientific discrimination than has hitherto been the case.

McDougall[8] deplores the more modern conception of functional disorders which has specially hindered the progress of psychiatry in England. Through his war experience he states that functional disorders are commonly the expression of subconscious purposes, or of the disharmony of conflicting purposes which may be wholly or in part subconscious. It is therefore through mental influences that these disorders are brought about. That is to say, they are psychogenic. In the emotional disturbances of the more chronic kind we tend to dwell on the bodily changes, losing sight of the essential fact that the mental change was the primary condition. It is in relation to the psychoses that psychogenesis is of greatest interest, and in dementia præcox the problem presents itself most definitely. Mott's deductions from his pathological work are severely criticized, and McDougall gives evidence to show that Mott is blindly prejudiced to obvious facts. He thinks we are justified in looking for a functional origin in manic-depressive and epileptic insanities, and considers that the most fundamental working conception for psychology must be purposive activity. Mind has a nature and a structure and functions of its own which cannot be fully and adequately described in terms of structure of the brain and its physical processes.

A wide and scientifically sane conception of psychiatry which should be studied by all is given us in a volume by William White, of Washington.[9] It is an excellent and broad exposition of the intricacies of psychiatric study taken from its many aspects, such as those of zoology, prehistoric history of man, child development, endocrinology, etc.

Mott has continued his researches[10] on the relation of the reproductive organs to mental disorders, and endeavours to show that the mental breakdown in adolescence, in the puerperal and lactational states in women, and in the involutive period in both the male and female sexes, is due to a failing of the libido of the psycho-analysts, which is dependent on bodily innate conditions. In both sexes a primary regressive atrophy of the reproductive organs tends to be productive of later mental abnormalities.

As an aid to differential diagnosis in mental disease, Stanford[11] has devised a method for the rapid and accurate estimation of the total nitrogen present per cubic centimetre in the cerebrospinal fluid, in order to trace evidence of products of degeneration of the central nervous system. As an aid to diagnosis this method has been in routine use for many years in the Cardiff City Mental Hospital, since the limitation of the Wassermann reaction and the reactions for excess of protein in the cerebrospinal fluid were found to be considerable. It is pointed out that the test will reveal abnormal breakdown of tissue without indicating the cause of that breakdown. The nitrogen number (being the number of hundredths of a milligram of total nitrogen per cubic centimetre) was found usually to lie below 20 in cases of mental disease other than those of general paresis, and almost always above 25 in cases of general paresis. By a method for the estimation of the total carbon of the fluid, it is in most cases possible to differentiate between general paresis and other forms of mental disorder, even when their nitrogen numbers lie in the ambiguous zones between 20 and 26. In all cases of mania, melancholia, and other common forms of psychoses, a negative result was obtained. In secondary or terminal dementia fairly high nitrogen numbers up to 30 are frequently found. Mere senility alone is not sufficient to give any positive results, and this leads to the conclusion that an acute mental condition preceding a dementia must have had some physical basis even though none is otherwise found.

Some experimental work has been done by Prideaux[12] on the expression of emotion in cases of mental disorder as shown by the psycho-galvanic reflex. The interpretation of his results are debatable to some extent, but it is interesting to note that, though the differences between certain classes are slight, they may be placed into three groups, according to the average decrease in resistance in ohms: (1) Healthy persons, anxiety states, and paranoia; (2) Conversion hysteria, manic-depressive insanity, epilepsy, and dementia præcox; (3) Dements, imbeciles, idiots, and general paresis. It is concluded that this reflex is conditioned by the state of the cerebral cortex; but the relative parts played by the skin, optic thalamus, and the reactivity of the autonomic system have to be determined. In patients with definite cortical degeneration or maldevelopment the reflex is very small or non-existent; in cases where organic changes in the cortex are probable it is very small; while in others in whom there is no evidence of cortical change it is much larger.

Those who are interested in the *psycho-analytical view of the psychoses* should study a special literary contribution from the pen of the Dutch psychiatrist Stärcke.[13] He is not so pessimistic as most people regarding the possibility of a therapy for the insane in institutions; but the contents of his article are too highly involved to discuss in these pages.

Morton Prince[14] has studied the mechanism of *hallucinations* by experimentally tapping the 'subconscious' by automatic writing. Subconscious introspection, too, was used to elicit further evidence as to the subconscious processes which were occurring during the writing and the hallucination. He came to the following conclusions: Hallucinations are the emergence into awareness of imagery belonging to subconscious thought. When hallucinations of this type occur in pathological psychoses, they are indications of the activity of a dissociated subconscious process as a factor in the psychoses. Thus the psychological problem of differentiating between normal imagery and hallucinations disappears, in that the mechanism of their production is identical. So-called hallucinations are only the normal imagery of dissociated subconscious thoughts.

Mention is made by James[15] of an unusual type of hallucination which was demonstrated to him in a case by Leroy, of Paris. It seems that many years ago Leroy drew attention to what he terms *Lilliputian hallucinations*, and since has made several communications on the subject. The patient sees small human figures, about 20 cm. in height, occurring mostly in groups or processions, gaily dressed and showing usually lively antics. The duration is commonly less than half an hour, and a case is cited in which they occurred daily for over two years. Aural hallucinations do not appear to accompany the visual ones. The condition occurs most frequently in patients suffering from alcoholism, drug toxæmias, senile dementia, and less commonly general paresis. In contrast to most toxic visual hallucinations, only interest and amusement is aroused.

*Dementia Præcox.*—Its hereditary transmission has been studied by Heise,[16] who investigated a genealogical tree extending through five generations and bearing seventy-five persons. With this material he examined the applicability of Mendelian principles, and concluded that the character 'schizophrenia' is recessive and not sex-limited. Where, in this tree, the frequent appearance and continuous transmission of the character may suggest dominance, there is seen to have been a convergence of bilateral psychotic taint (recessive homozygote with heterozygote ; R.R. with D.R.). Wherever, in this material, psychoses appeared that are certainly or probably schizophrenic, Heise found that the special taint existed in the families of both parents—and in an unusually pure form, mostly as a manifest schizophrenia.

Further pathological work has been published by Mott[17] on the genetic origin of dementia præcox, confirming his earlier researches. Following upon his findings of neuronic cerebral degeneration and regressive atrophy of the reproductive organs, he quotes Hughlings Jackson, "The last to come ontogenetically, the first to go", and thinks this dictum may be explained by the fact that the countless millions of cells of the cortex cerebri are developed from relatively few of the protomeric cells constituting the neural tube and primary cerebral vesicles. Therefore, if there is a germinal defective formative energy, it is this part of the nervous system, which is latest developed ontogenetically and phylogenetically, that will be affected either by arrest of development or by an innate lack of durability. The supragranular layer of pyramids of the neo-cortex is the latest developed, and may therefore, as in the imbecile, undergo arrest of development. As the sex instinct in adolescence matures, it stimulates and energizes all the cells of the body, including those of the brain ; but if there is a genetic inadequacy with a narrow physiological margin of the highest level of neurones upon which to function and maintain metabolic equilibrium, then any stress may be sufficient to cause hypofunction, with suspension or suppression of the normal activities of the highest and latest developed level, and disintegration of the psychic unity. Mott has found also that similar appearances of regressive atrophy of the testes occur in other psychoses than dementia præcox. Such,[18] working with Mott, has confirmed his pathological results.

Adolf Meyer[19] thinks that in this form of mental disorder there are enough instances of recovery to avoid the term dementia præcox, and uses schizophrenia instead. He makes very broad constructive formulations, and enters a plea for a dynamic conception. The compatibility of the affect with the content disorder is important diagnostically. The closer we come towards autistic thinking, projection, and the more or less leading hallucinations without adequate excuse by affect or without disorder of the sensorium, the more likely do we deal with schizophrenic reaction. The greater the incongruity of affect and content and the consequent distortion, the more ominous the condition. The prognostic issues depend on the severity of these tendencies, on the aptitude of the balancing resources to assert themselves inwardly and outwardly, and on the serious involvement of the metabolic and visceral functions.

A very broad view of dementia præcox is taken by W. White,[20] who thinks a formulation at the psycho-social level meets the case best. Dementia præcox is to him a regression psychosis with a malignant trend, this latter depending upon the depths of the regression ontogenetically and in the inclusion in the process of archaic phylogenetic material. All through the symptomatology evidences are seen of segmental over-domination, which are especially marked in the oral and anal zones, the skin areas, muscle segments, and respiratory zones, thus implicating organs which are expressed at the various organic levels. The disorder is therefore looked upon as a profound defect of biological adjustment. There are other regressive states indistinguishable from early stages of præcox, so that diagnosis by outcome must often be resorted to.

Stoddart[21] looks upon dementia præcox as really psychogenetic, and regards any organic changes in the brain and sex glands as secondary.

Three types of dementia præcox are recognized by Menniger,[22] based on the prognosis—one with ultimate and irrevocable dementia, another with attacks which are often recovered from but recur sooner or later, and a third ending apparently in a complete and permanent recovery. He thinks that many toxic confusional states given various nosological terms are really schizophrenic in nature, and from his study of psychoses associated with influenza believes that this disease may so affect the brain that a transient or permanent syndrome of dementia præcox may appear. In this connection he speaks of 'schizophrenia deliriosa', when a simple delirium comes on with the somatic illness or directly after it, but which persists and develops more and more into the clinical picture of dementia præcox ; and also of 'delirium schizophrenoides', when the psychosis arises coloured by schizophrenic reactions, so that a pessimistic prognosis is given which is belied by its eventual disappearance. It is maintained that these two forms are not essentially different, and that between the two there is every possible gradation, not in the intensity of the schizophrenic symptoms, but in the degree of what Menninger terms 'reversibility' (i.e., potentiality for recovery). Dementia præcox is thus a somato-psychosis, the psychic manifestation of an encephalitis, the benign or malignant character of which determines the prognosis. His clinical descriptions seem of some value, but his deductions are highly questionable.

Uyematsu[23] discusses the possible relationship between catatonic dementia præcox and hypothyroidism, since many facts seem to point to a connection, among others the shortened blood-coagulation time. He concludes that in this disease we are not simply dealing with a hypofunction but with a delicate functional endocrine disturbance, and that further than this we cannot go. Though Kraepelin states that syphilis is common in dementia præcox, Greene[24] sees in it no causative factor. Out of 495 cases he investigated, only 12 were found to have positive Wassermann and negative spinal fluid. Neurosyphilis, however, must not be ruled out as a possibility because dementia præcox is present.

For a very valuable contribution to the literature of this form of mental disease, reference is made to an article by Devine.[25] Herein is given us a careful psychological analysis of the complex and distorted emotional forces which were productive of certain bizarre symptoms in a long-standing case of schizophrenia. The psychogenic factors are of intense interest, and further work on such lines would be highly welcome.

*Manic-depressive Psychoses.*—It is not often that psychiatric publications make a distinct advance in our conceptions of any mental disease group, but in this respect the late August Hoch's work on *Benign Stupors*[26] stands high. The rigidity of the term manic-depressive has confused the problem of classifying many benign psychoses. Here Hoch has endeavoured to prove that, although elation and depression were the commonest anomalies in this group, they had no more theoretic importance than anxiety, depressed perplexity, or apathy. In other words, 'anxiety-apathy insanity' would be as appropriate as Kraepelin's term. His most significant contribution lies in the study of psychoses as psychobiological reaction types, and in the correlation of the symptoms observed. In this work there are described and analysed certain clinical entities whose outstanding feature is stupor, by reason of which Hoch thinks they are mistakenly included in the catatonic form of dementia præcox. In the acute form of the psychoses (usually appearing in the youthful period) there is marked excitement, which in a few days gradually subsides with the appearance of some degree of stupor. In the subacute form there is primary depression, confusion, anxiety, and apprehension, with various delusions of reference, accusation, and death, the latter being the most prominent by far, and being expressed as fear of death, desire for death, or being dead. As the depression deepens, stupor gradually supervenes. A number of physical symptoms are presented, such as emaciation, fever, irregular and rapid pulse, rapid respiration, and amenorrhœa, most commonly. The correlation of these with the mentality is not easy, and, though infection would be naturally suspected, none is found. That the fever should be due, as Hoch suggests, to increased heat production from muscular rigidity, and reduced loss from the skin from diminished adrenalin circulation (this latter because of the minimal emotional state), does not altogether sound convincing. For a few months, or a year or two, a varying level of stupor is manifested, with more or less loss of touch with environment and introversion of attention. There is mental vacuity, with all that that secondarily involves, and loss of affect. What ideation exists centres on death, and it seems that the particular conception of death entertained is responsible for the mood at the time ; thus fear of death is expressed by anxiety, death as union with God by manic symptoms, while belief in complete death is expressed by apathy. Infrequently, but appropriately, the stupor may be interrupted by smiling, crying, swearing, attempts to escape, or violence. The tendency to return to life for a few moments and then relapse is a particular characteristic of this stupor apathy. Negativism and catalepsy are common, tube-feeding is usually needed, and dirty habits are prevalent. In recovery all the symptoms gradually pass away. The importance of separating stupors from similar episodes occurring in dementia præcox is pointed out, and we are given the differentiating factors. In the latter, the personality make-up is different ; there is slow deterioration, perversion of energy (not limitation), inappropriateness of mood, scattered speech, with delusions not concerning death but with incest and genital sensations. Hoch regards the stupor as a regression to an earlier level, where ungratified cravings hitherto repressed are allowed to have free play, and he sees in the ideas a relation to mythology and the phantasies of our forefathers. Stupor is precipitated invariably in an unhappy situation in which the problem of solution is formed in death. This idea of death may first result in fear and anxiety. Suicide and rebirth phantasy naturally are here connected and frequently found. With the resolution of the conflict and the symbolization of the difficulties at a higher social level, the patient becomes ready to live life over again. Though the regression here seen is much deeper than in the great majority of manic-depressive cases, it is probably deeper still in the malignant stupors of dementia præcox. Notwithstanding this intimate study, it is doubtful if we have the right to assume that, because a case turns out to be 'benign', it belongs to the manic-depressive and not to the dementia præcox group. For many valuable criticisms on Hoch's work the reader is referred to Karpman's critical review on stupor and allied states.[27]

Hoch and MacCurdy[28] attempt to substantiate Dreyfus's contention that involutional melancholia is not distinct from manic-depressive insanity, though they find that the features common to the recovered cases of melancholia approximate to those which we associate with manic-depressive psychosis, while the salient features of the chronic cases are distinctly of the type we associate with dementia præcox, viz., auto-erotism, negativism, ridiculous hypochondriacal delusions. and perverse sexuality. They summarize thus: (1) Patients with involution melancholia recover unless they show as dominants (*a*) marked insufficiency of affect, (*b*) peevishness, (*c*) ridiculous hypochondriacal delusions, usually concerning the alimentary tract; these latter, however, may be present in women at the menopause without prejudicing the outlook for recovery. (2) All who eventually recover show improvement within four years of onset. The others run a chronic course or die unimproved.

*Paranoid Psychoses.*—Nolan[29] quotes the Kraepelian conception of paraphrenia, presents some interesting clinical histories of cases, and discusses the four paranoid groups, viz., paraphrenia systematica, paraphrenia expansiva, paraphrenia confabulans, and paraphrenia fantastica. An interesting story of a paranoid condition is given by Kehrer,[30] wherein he shows that a complete system of delusionary ideas may arise out of conflicts as a psychic reaction, and that on a basis of the fear of being persecuted a megalomanic conception may be produced, the position of the persecuted persecutor forming an intermediary phase. We have, however, good grounds for tracing the origin of such megalomania to far deeper sources than the superficial view that it arises from such a rationalization. Berkeley-Hill[31] gives an account of a case of paranoid dissociation which ran a chronic pernicious course. He states that the patient strove desperately to understand himself, but it was not until he consented to undergo psycho-analytic treatment that any change for the better could be observed in the pernicious tendency. After one month's analysis the patient began to show that he had some insight into his mental condition, to realize the etiological factors of his illness, and appreciate that his physician was able and willing to make every effort to understand the nature of the struggle through which he had gone.

*General Paresis.*—Attention is drawn by Taft[32] to the incidence of certain organic brain changes and convulsions in this disease. From his work he summarizes as follows: Sclerosis of the cornu ammonis (which anatomically forms part of the olfactory cortex) was described by Meynert in 1893 in relation to the convulsions of epilepsy. Anosmia has frequently been observed as an early sign in general paresis. Of 50 cases of general paresis examined histologically, 19 had a history of convulsions. Of these 19, all but one showed extreme loss of large pyramidal cells of the cornu ammonis, particularly those within the corpus dentatum. Thus, in the histological material examined, there was found an almost exact parallel between the occurrence of convulsions and the presence of marked cell degeneration of the cornu ammonis in 50 cases of general paresis.

*Psychoses of Childhood.*—True mental disease in children is very rare, according to Strecker,[33] who makes observations on the psychoses of childhood. Out of 5000 hospital admissions there were only 18 under the age of 15. In 4 cases the type was doubtful, in 19 the diagnosis was manic-depressive (the depressive phase being much more pronounced), and only 4 were brought under the heading of dementia præcox. These do not include post-infectious mental disease, juvenile paresis, or psychotic episodes in epileptics. In children the symptomatology seems more simple. There may be expected a varying grade of delirium, and subsequently an unmotivated excitement or depression with considerable confusion, often without delusions or hallucinations. In speaking of the childhood potential psychoses, Strecker draws attention to the shut-in personality which may eventuate in dementia præcox, and the undue emotional instability which may indicate a manic-depressive temperament.

*Psychasthenic Delirium.*—It is curious how few contributions are devoted to the subject of delirium, so that an article by Janet[34] on a highly interesting case of psychasthenic delirium is specially welcome. In his well-known graphic way Janet describes the transition from an obsessional state to a deliriant condition. In this state the female patient put into violent execution, and affirmed with the most positive conviction, all the ideas which previously she presented in the form of obsession accompanied with hesitation and doubt. She starts absurd acts of devotion, crys out that she must impose her will over others, and fights for days and nights. The very ideas which were formerly repugnant to her, and of which she spoke with fear, are now those which she furiously puts into execution. Janet differentiates such a state from confusional and manic conditions, and endeavours to explain its psychological basis, which, however, really only touches the surface. He sees in both phases evidence of voluntary action but at a different psychological level. At one level there is *immediate assent* to will and belief as in suggestion, but at a higher level there is *reflective assent* which expresses the average tendencies of the whole mind. It is this reflection upon which all the disease of the psychasthenic rests. The deliriant stage demonstrates the falling to a lower, more primitive level of psychological tension, in which reflection is completely suppressed, and the patient gives immediate assent without hesitation, regret, or control.

*Syphilis and Mental Disease.*—In discussing this relationship, Hoven[35] comes to the following conclusions from his modern work : (1) Syphilitic infection constitutes an important pathogenic factor in mental disorder ; out of a total of 205 cases admitted to his asylum in 1921, 17 per cent show positive signs. (2) The Wassermann reaction is always positive in general paretics, both in the blood and cerebrospinal fluid. (3) In other psychoses syphilis is often a predisposing and aggravating factor, and this action seems to be as important in certain cases of mental confusion, dementia præcox, senile dementia, and epilepsy. (4) Many unstable degenerates are infected. Kirby[36] states that in America since 1918 there has been a decline in the relative and actual number of cases of psychoses due to syphilis, and he thinks there are indications that education, prophylaxis, and improved methods of treatment are beginning to yield results which may be considered a sign of progress.

*After-effects of Encephalitis Lethargica.*—Cyril Burt[37] makes some notes on the after-effects of encephalitis lethargica in children. Of 24 cases (who had had normal mental health and intelligence previously), 18 were affected mentally. Of these, 7 were in a permanent state of idiocy, and others showed minor mental deterioration. The mental condition seemed to depend largely upon the severity of the initial illness and the age of the child when attacked. After a short illness, the stupor lasting for a few days only, the child as a rule completely recovers. If the lethargy lasts for three or four weeks, mental deficiency may be expected, at any rate if the child is young. The influence of age is still more important. The younger the child the more serious the after-result. In the older ones the chief disturbance is one of temperament and character, and delinquent tendencies not uncommonly develop. At times irresponsibility may be extreme, as seen in two cases reported by Macphail.[38] In one such case certification had to be resorted to because the little patient (age 10 years) was subject to frequent and sudden periods of excitement, when he became unmanageable, tried to jump over the window, to put his head in the fire, and to stab his mother with a knife. Prior to his encephalitis he had been normal in every way. A not common sequela of encephalitis lethargica, that with marked insomnia and nocturnal irritability as predominant features, is reported by Coburn[39]. The condition proved highly resistive to treatment.

*Mental Disease and Alcohol.*—At the annual meeting of the British Medical Association in 1922, the Section of Medical Sociology, in a most important and illuminating discussion took place on the problems which arise in society in connection with alcohol. Mott gave a valuable contribution[40] concerning alcohol in its relation to mental disorders. Physiologically the main and significant effects are upon the nervous system, these being entirely of a narcotic nature, releasing the lower levels successively from control, and thus often seeming to be excitant. Experience shows that all forms of antisocial conduct are dependent, not only upon the quantity of alcohol consumed and the period over which any variety extends, but even more upon the inborn degree of organization and stability of the highest psychic level. It is forcibly pointed out how unreliable asylum statistics are in relation to the influence of alcohol in the production of insanity, owing to the personal equation in regard to what constitutes excess, and the fact that other causal factors are so often neglected. At one asylum, out of 248 male admissions, alcoholic excess was the assigned cause in 18·5 per cent, and out of 246 female admissions it was computed at 15·4 per cent. On inquiry, however, it was found that 13 were imbeciles, 5 were cases of chronic delusional insanity, 5 were epileptic, 5 had organic dementia, and no less than 20 were cases of primary dementia. That is, out of the 84 cases quite half were mentally diseased or potentially so. The types of insanity in which alcohol is the *essential* cause are not nearly so frequent as is supposed, and these are the cases of delirium tremens, mania a potu, and Korsakow's disease. The cases of alcoholic insanity met with in asylums may be divided into two great groups : (1) Those who have an intolerance to alcohol owing to a *locus minoris resistentiæ,* especially of the highest psychic level ; (2) Those in whom chronic alcoholism, usually in connection with some other factor, brings about one of the above-named conditions. It must be noted how common alcoholic cirrhosis is in our hospitals, and yet, notwithstanding the excessive intemperance, no mental symptoms are evinced. This liver cirrhosis is not commonly seen in asylums, but when met with is usually in cases of Korsakow's syndrome or alcoholic dementia. Alcohol, therefore, is not such an *efficient* cause of insanity as official published reports indicate. Both Sullivan and Bevan Lewis show conclusively that in the regional distribution of insanity it is difficult to trace any evidence of alcoholic influence such as might be expected if alcoholism really accounted for a sixth of the total number of cases. It is well stressed that if alcohol is the essential factor in the production of a psychosis there will be certain specific indications pointing to the more or less specific action of the drug, and certain physical signs indicating alcohol, even in the absence of a history of indulgence. This fact has been noted also elsewhere,[41] and this is one reason why so-called alcoholic hallucinosis should not be included in the alcoholic psychoses.

At the same meeting the American psychiatrist MacCurdy gave his views[42] on the general etiological factors in the alcoholic psychoses. With regard to prohibition in America, he sees the folly of drawing any conclusions of permanent value at present concerning its effect on the nation's mental health, and since we have not yet finished with the results of the war we can infer nothing of lasting worth from the contemporary insanity rate. He agrees with Mott and others in including only delirium tremens, Korsakow's syndrome, and alcoholic dementia among the true alcoholic psychoses. In acute alcoholic hallucinosis, and in the paranoid group, he thinks we are mainly dealing with constitutional anomalies. MacCurdy draws attention also to those alcoholic cases which show a gradual deterioration which is emotional rather than intellectual, and can thus be distinguished from the arteriosclerotic type. With faculties relatively intact, the patients gradually become indifferent to their responsibilities, lose ambition, and their affections wane. They are pathological loafers who do not usually find their way into institutions, though often paranoid ideas are present. This deterioration is a good deal like that seen in some cases of dementia præcox. This authority formulates in general terms the rôle of alcohol by saying that it liberates abnormal reactions that have been latent, and at the same time increases whatever fundamental tendency to abnormality there may be. There is, then, a vicious circle. Two general effects are produced: the intellect is dulled, and, by removing inhibitions, previously unconscious anti-social tendencies are liberated. These anti-social tendencies are inextricably mingled, as both cause and effect, with general maladaptation. Our individualistic strivings are repressed to the unconscious. If we are adaptable, we can give some outlet to them in a socialized form as permissible personal ambition. If we fail in adaptation, these unconscious complexes tend to appear in a less permissible form. The man who wants to forget reality drinks; he gains the desired release. This release, though, is purchased by impairing those very faculties that are needed to attain success, and the anti-social tendencies liberated at the same time increase the maladaptation. The alcoholic drinks to forget, and thereby increases that which he would forget. This is the vicious circle. If the etiology of alcoholism were simply alcohol, mere abstinence would cure the condition. Since normal man is a psychiatric fiction, we must all face some of the difficulties of the psychopath, and find, it may be, an aid in alcohol. Conviviality is more important for our mental stability than we realize, and the strong position alcohol holds is due to its socializing influence. In conclusion, MacCurdy sees possible evil consequences of prohibition from the social and psychological standpoint, and reminds us that alcohol eliminates the unfit.

Sullivan, whose opinion carries authority, in discussing these papers, regards it as almost certainly unsound to suggest that alcohol was an important cause of certifiable insanity, and sees evidence in the war years which offered convincing proof that for the most part alcoholism was a negligible factor in the causation of insanity. Much crime, however, and suicide, must be laid at its door.

The users of 'moonshine' whisky in America, according to Lemchen,[43] do not develop the ordinary type of alcoholic psychoses, but develop a stuporous state in which they become more or less unconscious, and from which they either die or recover, and when they do recover they have an amnesia for that period. The sufferer may perform almost any act while under its influence, but recollects nothing subsequently, this being akin to pathological intoxication or epilepsy. If any hallucinosis does come about, it is mostly visual. Bearing in mind (1) that for the production of delirium tremens there is required, besides chronic alcoholism, some other factor—probably a toxin whose presence is due to morbid alterations of function of the intestine; (2) that the liver of the drunkard, as the frequency of cirrhotic and fatty changes shows, is much exposed to damage; and (3) that one of the liver's functions is an antitoxic one whose failure allows a flooding of the whole body with toxic substances, Bostroem[44] is led to see how important it is, for an understanding of the pathogenesis of delirium tremens, to investigate the functioning of the liver. From his observations he concludes the damage of the liver has probably a causal relation here. A temporary failure of the antitoxic functions leads to a flooding of the body with abnormal metabolic products, to which the brain, already damaged by alcoholism, responds with delirium tremens. The failure of liver function is due to an acute exhaustion of the liver-cells, which have been overworked in consequence of the alcoholism.

*Mental Deficiency.*—Its nature has been well dealt with by Tredgold.[45] He would apply the term to any marked falling away from that degree of mental capacity which is the normal or average in the race to which the individual belongs. This, however, is not synonymous with mental deficiency in the legal sense. In order adequately to grasp its nature the most hopeful plan is to study the normal mind from its evolutionary and comparative aspects. With this purpose in view the mind may be divided into three main groups, namely, perception, apperception, and feeling; and these may be considered at four evolutionary levels. The lowest level (Level 1) represents the primitive vertebrate type of nervous system, consisting of afferent and efferent pathways and central ganglia. There is no consciousness and no volition, but conduct is the product of innate reflex mechanisms. The next (Level 2) is that of the higher mammals. It is characterized by an increased development and a differentiation of the neuronic germs into three psychic processes, perception, apperception, and feeling. Level 3 is representative of primitive communal man, where further mental elaboration has taken place. Perceptive processes are now divisible into three classes: capability of forming more elaborate percepts and concepts, a capacity for forming simple abstract ideas, and a capacity also for symbolic imagery. Feeling has similarly evolved, emotions are more complex, and some have become organized into groups of sentiments. An elementary social sense is in evidence. Apperception, too, has evolved. There is active attention, a capacity to form simple judgements, an ability to foresee consequences, and an increased power of volition. In Level 4 we arrive at civilized man, where there is an enhanced development of each of these functions. The perceptive group forms the basis of learning, and is made up of (1) complex concepts, (2) complex abstract ideas, (3) symbolic perception, (4) deliberation and reasoning, (5) volition and resolution, (6) prudence and planning, (7) æsthetic, (8) religious, and (9) social and moral sentiments.

In applying the foregoing to psychological defects, we see it is obvious that individuals differ regarding their general evolutionary level, and as to the relative development of the three named psychological processes. Other individuals appear to be at the extremes of, or even outside, this normal range, and are characterized by such an excess or defect in certain processes as to constitute a decided abnormality. In the eyes of the law the term 'mental deficiency' is applied with a specific meaning, and the criterion of its presence is a social one. What is the particular psychological defect which constitutes legal mental deficiency? A general capacity for learning equivalent to that of Level 4 is necessary to hold an average place in a civilized community, though an individual can maintain existence in a humbler life in such a society with perceptive functions equal to Level 3. Below this there will be such an inadequate appreciation of surroundings as to require some supervision, and such a person will be a defective. Though the emotional processes are by no means essential to the maintenance of existence without supervision, it is different with regard to the moral or social sense, where the incapability of conforming to codes and laws renders the need for supervision and protection necessary. Where these latter are completely absent in an individual we have *moral imbecility.* If not entirely absent, much depends upon the amount of wisdom they possess. Given a moderate amount, their apperception usually suffices to keep them within the law, though they are potential criminals. It would therefore appear that a development of the processes of feeling equal to, or even less than, that of primitive man, provided intelligence is present, is sufficient to prevent the individual being certifiably mentally defective. It is the apperceptive functions which mainly control actions and adapt them to more remote considerations, and so development in this sphere chiefly determines the legal status. A development equal to Level 4 is essential for an individual to hold his own in a complex environment, while under simpler surroundings an amount of intelligence no greater than that of primitive social man (Level 3) will suffice, and he will not therefore be a mental defective. Level 3 represents the minimum of intelligence compatible with adaptation in a human community. With any markedly less development control is required, and he will be legally mentally deficient. There are, however, 'borderlanders' who have slightly less intelligence than Level 3, and who survive in favourable circumstance, sbut reveal the latent defect in the face of competition and varying circumstances. Tredgold also draws attention to those individuals who are not markedly deficient in perception or feeling, who are not educationally very backward, not greatly, if at all, lacking in moral sense, and in whom tests show fair reasoning, and yet they are so emotional and unstable that they cannot settle down and follow a definite course. He thinks the special defect is one of volition. They know the course to take, but cannot focus consciousness on the idea to overcome distractions, and so drift aimlessly. These cases are not usually regarded as mentally defective, but their condition is so clearly due to a psychological abnormality that, if this is permanent and has existed from birth, they would seem to come within the statutory definition.

Pierce Clark and Atwood[46] discuss the etiology of feeblemindedness, and show that it is an increasingly difficult task to apportion the precise rôle which the factors play. The admission that in mental defects there is a notable percentage of neuropathic cases in the ascendants throws no light on the mechanisms involved.

In order to throw some light if possible on the part played by *syphilis* in the causation of mental defect, Key and Pijper[47] investigated 217 cases of amentia, wherein they demonstrated the presence of syphilis by means of the Wassermann reaction in 55·2 per cent. They concluded that the syphilitic virus cannot alone be responsible for the amentia in all these cases, and they were not successful in observing any symptom or group of symptoms common to the cases giving a positive reaction. They felt in complete agreement with Shuttleworth and Potts in regarding syphilis in itself as a sufficient factor in the causation of mental defect, and in thinking it often has a deciding influence where there is a morbid heredity or other unfavourable factors.

Prideaux[48] draws attention to some of the relations between the *psychoneuroses* and mental deficiency. The psychoneuroses may be superimposed upon an existing amentia, especially of a high-grade type, this more often occurring with conversion hysteria, which was so specially apt in the war to affect the private soldier more than the officer. An analysis of Prideaux's war neuroses showed very clearly the liability for those who had been in lower standards at school to suffer especially from conversion hysteria, while those who reached the higher standards suffered from anxiety states. The higher grades also tended towards a more complete recovery as the result of treatment. In the family histories of the feebleminded in Cambridgeshire in whom there was evidence of a neuropathic inheritance in 90 per cent, it was common to find that one of the members had had 'shell shock'. It is seen, too, that many of the symptoms, both physical and mental, including delinquency, pathological lying, etc., are common to both conditions and require differential diagnosis. The most important of the mental symptoms common to both are those related to the affective life, though a psychoneurosis in early childhood may be the cause of considerable retardation, and is often responsible for intellectual disturbances.

*Mental Disease, Delinquency, and Crime.*—An ever-increasing interest and study of the part the mentality plays in delinquency and crime is in evidence. It is gratifying to note that serious work is being done by many competent authorities, and that a distinct advance in our knowledge of the intricate problems involved has been made. Cyril Burt[19] has given us a searching psychopathological analysis of the causes and treatment of juvenile delinquency. As a psychologist he has delved deeply, and he agrees very largely with many of Healy's findings. He thinks that mental deficiency as a cause has been overstated, though 30 per cent of delinquents are classifiable as technically backward in general intelligence. In some degree they make up for their incompetence by shirking, lying, and finally by stealing. In treatment, owing to lack of intelligent co-operation, psycho-analysis is useless, but in intelligent cases this method is advocated. Deep hypnosis has had good results, and the suggestions should be positive and concrete rather than negative and abstract. Intellectually 4 per cent of Burt's cases were distinctly above the average, but it is the emotional factors that are of more importance, and more than half his cases were emotionally unstable. The common forms of juvenile offence he finds correspond to the current psychological classification of the primitive instincts, the delinquency being the natural manifestation of one of them. This, however, is only rarely adequate as any explanation, and in older cases with more intelligence there is in the background a highly complicated psychological mechanism. Any inborn criminality is denied, and any native impulse may, in a civilized community, become criminal, and especially so in sexual vice. Instinctive angry displays of an infant may take a criminal turn at an early age. It is thought that many petty thefts are almost reflex, though it is commoner to steal through desire. The stolen article may be symbolic of something desired, and stealing may commence as a substitutional reaction for a baulked impulse. Acquisition differs from the other instincts in being a cumulative process, and this conspires to make it responsible for 90 per cent of crime. Among the delinquent's inherent psychological features emotional instability is the most frequent and the most influential, and it is this that treatment must be directed against, though habit formation must be taken into account. Some special instinctive urge pushes the victim towards a vaguely wanted end, and until attained the possessor is in a state of restless craving. The absence of desirable interests seems far more marked and frequent than the presence of undesirable ones. Hatred, revenge, and rebellion against authority, partly or wholly repressed, are not uncommonly basic factors in causation. Of all forms of mental repression the simplest and most characteristic is that resulting from a conflict between some inborn instinct on the one hand, and some acquired sentiment upon the other. This is often noted in the sexual sphere, resulting, may be, in the phenomenon of *substitutional delinquency*. The child half automatically, avoiding what he considers the greater sin, indulges by way of relief in some lesser criminality, this being perhaps linked with the original temptation. The whole discussion points to the need for an intensive study of each individual offender. For juvenile delinquency there is no one cause, no one cure.

Sullivan,[50] who can speak with special authority, discusses the sociological connotation of crime, and denies the existence of any specifically criminal attitudes. Criminal conduct involves for the most part the same impulses as non-criminal conduct, so that it is idle to look for a specific biological difference, though there are biological conditions which may in a certain sense predispose to crime. Most unprofessional crime is due to failure of inhibitory control from an unduly strong impulse or an unduly weak control, such factors varying in each individual under the influence of the modern complex life. Maximum criminality is found at the period of adolescence, as we should expect to find if crime were due to weakness of inhibitory control. In the seasonal fluctuations of sexual offences we see the factor of strength of impulse demonstrated, as increase of sexuality in the spring and summer is a well-recognized fact throughout the animal world. It is found that the number of conceptions is higher in the months of May and June, and it is at this period that rape and indecent assaults are most prevalent. In mental deficiency it is not uncommon to observe an excess of instinctive activities, so that criminal acts seem more related to abnormality of impulse than to failure of inhibition. It is obvious, therefore, that mental defect should predispose to crime, and in England it has been estimated that 10 to 20 per cent of the inmates of prisons are mentally defective, while in the general population the proportion is about 0·5 per cent. Though some crimes from their nature are obviously due to mental defect, it is quite inconsistent with the facts of clinical experience to presume that there is an inherent defect in all criminals. Sullivan points out that mere absence or deficiency of moral sense in a criminal does not warrant applying the term 'moral imbecile', who must present also some degree of intellectual deficiency, and the statutory definition is for various reasons not altogether approved of. The criminal conduct of these imbeciles is distinguished by the precocity of its appearance, the variety of its direction, and its occasional gratuitous character. In all cases there is the common trait of insensibility in respect of the particular form of moral feeling involved, with an entire incapacity for experiencing shame or remorse. Attention is drawn to the fact that this form of mental deficiency has some affinity to epilepsy, and has apparent relations in some cases to head injury in childhood. The pathological swindler may also be counted in this group of moral imbeciles, though the ethical defect is of a less generalized character.

Excellent work is being done with criminal offenders in Birmingham by Hamblin Smith and Potts, and owing to the scheme carried out it is now very rare to get a mental defective or a psychosis case from that city on conviction. Hamblin Smith,[51] the medical officer, has given us briefly his views of his medical examination of the delinquents. He points out how various physical ailments may conduce to anti-social conduct. A severe physical defect handicaps the means of earning, both directly in the labour market and by engendering bad habits of industry. Defective vision in the young may be undiscovered, with consequent inability to work properly, and punishment received may result in mental conflict and delinquency. These disabilities may also tend to make their possessor anti-social, because they induce the feeling that they are not as other men are. Every offender presents a problem of his own. This writer has become dissatisfied with the Binet scale of mental tests, and has evolved a scheme of his own. He finds that Freudian principles have been highly valuable as a stimulus to a new conception of the problems he meets with, for mental conflict is constantly found in his delinquent cases. Hamblin Smith, in giving details of his methods, very rightly states that there are many reasons why mental examination before conviction is preferable to such afterwards. At the end of the remand period he makes his report and gives suggestions for treatment. During his two years of office in Birmingham, less than 25 per cent of these specially remanded cases have been sentenced to imprisonment. Those who would deal with delinquents require certain definite qualifications, and local asylum officers at present are not regarded as the ideal people for the work. Since the real, basic problem of delinquency is not its cure but its prevention, working hand in hand with the school medical officer is called for. The problem of responsibility for criminal acts, and the parts to be played in its solution by mental physicians and the legal bench, have been much before the public, and more especially so in connection with the case of Rex *v.* Ronald True. It is not within the scope of this contribution to dilate upon the many and interesting points then raised, but the inquirer may read an excellent report of the case by Hamblin Smith,[52] who also criticizes the various points of view.

That a psychiatrist has a distinct place in court work is well illustrated by an article by Scott,[53] who gives a summary of the result of 300 psychiatric examinations at a woman's day court in New York. Similar interesting work in a girls' reformatory is reported by Spaulding.[54] At a conference on mental deficiency (July, 1922), East, of Brixton Prison, who is fully alive to these modern problems, stresses like Hamblin Smith the importance of a full mental investigation before conviction if possible in all cases where there is ground for suspecting that the criminal is a defect, though he frankly avows that a long period of observation may be required before an accurate opinion can be offered. In his analysis of 125 cases he points, as others have done, to the preponderating number of cases of uncontrolled acquisitive and sex instincts. It is patent, as East says, that the great necessity is the prophylactic one of instituting treatment clinics for cases of mental disorder and defect. In this way much criminal action may be obviated.

*Suicide.*—Until of late years the psychopathology of suicide has received little if any attention, even though in many cases the desire was so disproportionate to the seeming cause. In children the seeming inadequacy of motive has often been particularly marked. It might be presumed that some very deep-lying factor is at work to controvert thus a biological instinct to live. Psycho-analytical study has thrown some light on the subject, though we are far from understanding the primary processes involved. In the last number of the MEDICAL ANNUAL (p. 268) Freud's theory of the psychological mechanisms at work in melancholia was spoken of. He thinks that, through 'narcissistic identification', a love object becomes incorporated within the ego, and that when hostile feelings become directed against that object (which through some fault has lost value for the individual), the personal ego is treated in the same manner and suffers the same expressions of revenge. Reasoning from this, it is possible that involved in all suicide there is the element of 'inverted sadism'. The factor of revenge upon some love object, with some idea of martyrdom (" See what you have driven me to "), is by no means uncommonly noted, and Stekel would go so far as to think that the idea of retaliation on self is frequently, if not always, present, and that suicide therefore always involves the unconscious death wish of another. An unconscious sense of guilt is probably also frequently implicated in the psychological picture.

Freud has gone somewhat further,[55] and has postulated an interesting speculative hypothesis that there is an innate 'death instinct' which urges us to reach a state in which there is a relief of all tension, a Nirvana. It is possible that the sex instinct acts as a stimulus to face reality, but given sufficient impediment to the libido's demand there may be such regression that the death instinct comes into play. Much would depend on the love craving, which, of course, varies individually. However fanciful such ideas may be, they are highly interesting reflections.

In two psychopathological studies of literary fiction, Stragnell,[56] in the analysis of some of the characters, deals with the question of suicide from the point of view of sadism and masochism. He regards every suicide as a potential murderer, which would explain the frequency of suicide or suicidal attempts in sadistic or masochistic states. He sees in suicide a complete escape from the world of reality. The sadist will commit suicide at one fell swoop, while the masochist is more likely to resort to the slower process of self-destruction through privation or by inviting some disease to take foothold and flourish.

Ring,[57] too, discusses the factors in suicide. He thinks that there are many born with a sense of inadequacy, who specially crave for love and sympathy, and, in the face of friction with the instinctive feeling-tone of self-abasement, are often potentially suicidal. Suggestion by example is not infrequently brought into play in the predisposed, and a definite suicide obsession may be present, though only in the fringe of consciousness when stress is absent. In depressed states it is possible that physical factors such as faulty action of the autonomic nervous system may be primary. Those who have repressed excessive sexual desire are frequently suicidal candidates. The antithesis of the wish to beget life is to destroy it. He quotes Swann, of Cambridge, who has often found atrophied testicles in those who commit suicide. Sexual perversions, especially homosexuality, are predisposing in sensitive natures, and both sadism and masochism may be intimately related to the impulse. Besides melancholia, Ring regards acute hallucinosis as dangerous in this respect, Cerebrospinal syphilis may lead to self-destruction, as also arteriosclerosis occasionally. Psychasthenics rarely carry out such an act, because of their indecision, though attempts may be made.

## TREATMENT.

For manifold reasons it is obvious that our main resource in this direction must lie in *prophylaxis* ; but the nature of any such measures can only be adequately applied through an intimate knowledge of human development, both ontogenetically and phylogenetically, and of the factors of adaptation to modern civilization. Later psychological knowledge has thrown much light on these points, and so paved the way for an individual and social education which should do much towards obviating mental disorder.

That *occupational therapy* tends to bring about many desirable results in psychotics was emphasized in the last number of the MEDICAL ANNUAL. Such methods should be more extended in this country. Sutton,[58] who is the chief educational therapist at the Illinois State Hospital, gives some account of eighteen months' work in this department.

Spaulding[59] cites some cases to demonstrate the value of *combining endocrine therapy with mental analysis* in the treatment of certain types of personality deviation. Though Adler has pointed out the many traits that may result from glandular inadequacy, there still remains an almost unexplored field in the study of personality to be reached by the psycho-physical route. As has been already pointed out, in our present state of knowledge of the rôle played by the internal secretions in the human economy such treatment must be mainly empirical, Fay[60] has also experimented on these lines.

From the findings of Meltzer and Auer many years ago that the primary effect of magnesium upon nerve-cells was that of paralysis without any preceding excitation, Western[61] was led to try if magnesium might not be of value in excited mental states, and he gives the results of the use of **Magnesium Sulphate** in hypodermic doses of 1 or 2 c.c. of a 25 or 50 per cent solution as a sedative. In all more than 250 doses were given to 50 patients. Half of them were agitated depressions, seven were dementia præcox, four were paretics, and there were one or two each of epilepsy, senility, organic dementia, and hysteria. One was actively manic, and all were more or less agitated. The result in nearly all cases was the same. The patient relaxed and slept from four to six hours. Some patients did not react at all. Of the total 250 doses, 30 were without effect. The most marked effect was obtained in simple agitated depressions. Western, however, from this trial does not make any hard-and-fast deductions.

Daday, Bessière, and Jaloustre[62] have experimented with **Thorium X** in mental therapy. In 9 cases of melancholia no change was seen, and in 4 cases of dementia præcox 3 were unchanged. There was marked success in an early case of dementia præcox which was rapidly becoming chronic, but the symptoms cleared up so rapidly that he was discharged from the asylum in a few weeks. In 3 cases of confusional insanity, 1 remained unchanged. In the other 2 cases improvement began in about ten days, which was after the second injection, and both were discharged in five weeks. The conclusions of these investigators were : (1) Thorium X is inoffensive even in big doses ; (2) When thorium is going to be efficacious, improvement shows itself after two or three injections ; (3) The action seems to be nil in chronic cases, but successful results were obtained in the three acute cases mentioned, warranting further trial of the method. The way in which thorium X acts is not understood, but improvement is undeniable. The technique consists in giving five weekly hypodermic injections of an isotonic solution of bromide of thorium X, rest for one month, then five more injections. Thorium is put up in ampoules which contain doses ranging from 10 to 1000 micrograms. Radio-activity of thorium X diminishes by half in three days, and in twenty days all activity is gone. This is a safeguard against cumulative effects.

Professor Oscar Fischer, of Prague,[63] has experimented with a new preparation he calls '**Phlogetan**'. It contains nucleinic acid, and good results have been reported from its use in general paresis. In 1892, Hornaczevsky, of Prague, made experiments with this acid, when in animals it produced a marked increase of leucocytes. The idea is that remissions often occur in general paresis after febrile intercurrent affections found to be due to septic infection, and in sepsis leucocytosis is constantly present. Attempts have been made to improve results with phlgethan, which consists of nucleo-proteins so far broken down that it neither has the character of albumin nor contains nucleinic acid. Better results seem to have been obtained, but nothing of a definite nature can yet be said.

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## MERALGIA PARÆSTHETICA.

*J. Ramsay Hunt, M.D.*

Goldstein[1] records five cases of this affection (neuritis of the external cutaneous nerve), three cases occurring in the same family. Most of the literature on the subject has been written during the past twenty years. In 1900 Meirowitz reported a case in which the condition was probably due to the long-continued pressure against the thigh, standing at a table in ironing coats, thus affecting the external cutaneous. There was anæsthesia, tactile hyperæsthesia, and at the lower part of the affected area the touch of the finger was painful. Bramwell exhibited a case of Bernhardt's *Sensibilitätsstörung*, or meralgia paræsthetica, in 1902. There was pain over the right hip and over the lower part of the right thigh anteriorly, also a feeling of coldness on the outer side of the right thigh. The pain was greatly increased on walking, and incapacitated him from work. The condition was attributed to sleeping on hard boards in damp clothes. A relative cutaneous anæsthesia was present on the outer side of the right thigh, while there was marked tenderness on pressure over a point an inch and a half below and just external to the right anterior superior iliac spine.

In Miller's case a corset-pressure appeared to be the causative factor, and cutting out a section of the corset cured the patient. Some of the reported cases have been improved with **Faradism.** Resection of the nerve is to be done as a last resort in severe cases. There seems to be no definite causative factor of the disease. It appears to be much more common in men than in women. Influenza, gout, syphilis, corset-pressure, table-pressure, hernial truss or belt, alcoholism, constipation, pregnancy, traumatism, long standing, typhoid fever, rheumatism, diabetes, obesity, and hereditary influence have all been mentioned as possible or probable factors in its causation. In one case there was found a spindle-form swelling in each external cutaneous nerve at the point where it crossed the crests of the ilia. In these regions there was evidence of neuritis and perineuritis.

Roth, who wrote a short monograph on this disease, reported 14 cases (1895). In all of his patients the area of pain was the same—the distribution of the external cutaneous nerve. A burning sensation may extend at times over the whole thigh. In 5 cases the condition was bilateral. Roth believes there may be some compression of the nerve either in its passage under the psoas muscle, or where it runs close to the anterior superior spine of the ilium. Goldflam reported a number of cases who were arteriosclerotics, past middle life.

*Roth's points* are: (1) Just after the exit of the nerve where it passes beneath the psoas muscle; (2) Where it curves around below the anterior superior spine; and finally (3) The fibrous canal in the fascia lata. Among the mechanical factors responsible there have been mentioned the pregnant uterus, pelvic tumours, varices, tight bands, direct trauma, and flat-foot. Pressure on the nerve by the lower edge of Poupart's ligament was found in one case, and the symptoms disappeared after partial section of the ligament. Hereditary influences may play a part.

Six cases of meralgia paræsthetica are reported in this paper—two women, two men, and two young boys. There are probably 135 cases of this interesting affection recorded in the entire literature. The etiology is not settled. Infection, strain, and persistent continued slight trauma have some bearing and influence on the appearance of this condition. Treatment depends on the cause, if that can be discovered. Rest is necessary, and avoidance of the usual occupation that traumatizes the front and side of the thighs, as well as excessive walking, jumping, or continued standing.

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## MILK SUPPLIES, PURE.

*Joseph Priestley, B.A., M.D., D.P.H.*

Milk is the only food known that is capable of serving as a *sole* dietary. For infants and young children it is essential, as also for invalids. The necessity for purity, therefore, goes without saying. The Ministry of Health has taken recently an important step forward in arranging for the licensing of certain classes of milk, known as: (*a*) Certified; (*b*) Grade A (tuberculin-tested); (*c*) Grade A (non-tuberculin-tested); and (*d*) Pasteurized. This power to license is given under an Order known as the Milk (Special Designations) Order 1922, and an amending Order known as the Milk (Special Designations) Amendment Order 1922—the former Order made on Dec. 9, and the latter on Dec. 18, 1922. The licensing authority must be satisfied as to the arrangements and conditions and processes under, and by which, the milk is produced, stored, treated, and distributed, and at all times kept separate from all other milk. The Orders have been made under Section 3 of the Milk and Dairies (Amendment) Act 1922, and the licences are to be issued as follows:—

1. *By the Ministry of Health*—to producers of certified and Grade A (tuberculin-tested) milks.
2. *By County and County Borough Councils* (in certain circumstances by Urban and Rural District Councils)—to producers of Grade A milk.
3. *By Sanitary Authorities*—to distributors of certified, Grade A (tuberculin-tested), Grade A, and pasteurized milks.

N.B.—Licensed producers distributing direct from the farms to consumers are not required to be licensed by sanitary authorities as well.

The conditions of license are strict, viz.:—

1. *Certified Milk.*—(*a*) Herds to be inspected every three months by veterinary surgeons and to be tuberculin-tested every six months, and only to be continued in use as milk producers conditional on such inspection and testing proving *negative*; (*b*) Milk to be bottled on the farms immediately after production, in bottles that are hermetically sealed and the caps bearing the name and address of the producer or of the dairy, the day of production, and the words "certified milk", together with the words (if so desired) "produced from cows that have passed the tuberculin test"; (*c*) The milk to be delivered to consumers in the sealed bottles; (*d*) The milk, on bacteriological examination, to

show not more than 30,000 bacteria per c.c. and no *B. coli* in $\frac{1}{10}$ c.c.; (*e*) The milk not at any stage to be treated by heat.

2 and 3. *Grade A (tuberculin-tested) and Grade A Milks.*—(*a*) Herds to be inspected every three months by veterinary surgeons, and, in the case of Grade A (tuberculin-tested), also tuberculin-tested every six months as in the case of certified milk; (*b*) Milk to be sent to the consignees and customers in unventilated sealed containers or bottles (also hermetically sealed)—the containers or bottles to be labelled or suitably marked with the address of the dairy, the day of production (with, in the case of containers, the word 'morning' or 'evening' according to the time of milking), and the words 'Grade A milk'; (*c*) The milk, on bacteriological examination, to show not more than 200,000 bacteria per c.c. and no *B. coli* in $\frac{1}{100}$ c.c.: (*d*) The milk not at any stage to be treated by heat, except in those cases where the licence allows pasteurization also, in which cases the label must state that fact by the addition of the word 'pasteurized' after the words 'Grade A Milk'.

4. *Pasteurized Milk.*—(*a*) The milk to be pasteurized in a suitable and approved pasteurizer, and to be retained at a temperature of not less than 145° F. and not more than 150° F. for at least half an hour, and to be immediately cooled afterwards to a temperature of not more than 55° F.; (*b*) The milk not to be heated more than once, and not to be otherwise treated by heat; (*c*) Every vessel containing the milk to be suitably labelled with the words 'pasteurized milk', and the day of pasteurization; (*d*) The milk, on bacteriological examination, to show not more than 30,000 bacteria per c.c., and no *B. coli* in $\frac{1}{10}$ c.c., after Jan. 1, 1924, prior to that date the requirement being limited to not more than 50,000 bacteria per c.c.

N.B.—To enable firms to change or alter their pasteurizing plants, the Amending Order (Special Designations) of Dec. 18, 1922, allows conditions (*a*) and (*b*) to be held in abeyance, and the applied-for licences issued notwithstanding, until July 1, 1923, provided the milk is treated meanwhile not more than once by a suitable heating process and immediately cooled to a temperature of not more than 55° F.

A licence permitting a producer to sell milk produced by him as 'certified' shall entitle him to sell such milk as Grade A (tuberculin-tested) or as Grade A—but not as Grade A (pasteurized) or as pasteurized.

It will be noted that these Milk (Special Designations) Orders 1922 give official sanction and encouragement to pasteurized milk. It may be assumed therefrom that the milk is not deteriorated as a food by such a process—at least in the opinion of the Ministry of Health. Meanwhile, dried milks are coming into more general use, and Glaxo finds strong competitors in Cow and Gate, Ambrosia, Trufood, etc. The last named (Trufood) is a sort of dried, condensed, and homogenized milk, which has recently been favourably reported upon in the *Journal of State Medicine* as an excellent dried milk, which dissolves readily and completely in *cold* water, and is found to respond to the usual tests for enzymes or ferments and vitamins. Trufood is condensed in vacuo and converted into powder by being sprayed (under very high pressure) in a fine stream into a chamber, in which there is a current of warm, dry air, which at once converts the sprayed condensed milk into an extremely fine creamy white powder at a temperature of about 60° C. to 70° C. None of the solids in the milk are thereby changed, but the casein is in a very fine state of subdivision, and coagulates into softer clots than ordinary cow's milk does, or even than other kinds of dried milks do. Bacteriologically, the reconstituted milk gives the standard of 'certified' milk: indeed, is well within the standard of bacteria per cubic centimetre allowed. No preservatives are used. The firm also supplies a dried humanized milk with lessened caseinogen or lactalbumin, and increased fat and milk-sugar. A chemical analysis of this mixture is indistinguishable from that of mother's milk. It is called humanized milk powder.

The nature of the 'bacterial content' of the dried milk is worthy of note. The latest view is that the *Streptococcus lacticus* must be retained in the reconstituted milk, so that no process of drying should submit the milk to a temperature higher than the known thermal death-point of that particular germ—i.e., a temperature of about 150° F. generally speaking, but in some strains or varieties of that particular germ a temperature of about 170° F. The healthy child's intestine shows many lactic acid organisms ; the unhealthy child's, practically none (their places being taken by putrefactive or other sporogenous germs). The moral is obvious. Endeavour to retain in the child's intestine a large preponderance of the *Streptococcus lacticus*, and, with that end in view, administer milk food that, in preparation, has not been deprived of those particular germs by the application of high temperatures (sterilization) or otherwise ; or, as an alternative, administer a mixed culture of *Streptococcus lacticus* and *lacto-bacillus* with the milk food that has been so deprived. In properly selected cases, the results are bordering on the marvellous. A comparatively simple remedy like this sometimes works wonders, and goes to show the simplicity of infant feeding, when scientifically understood. There is really nothing simpler, and yet the medical curriculum does not insist, as it should, upon all aspirants to the medical profession having at least three or six months' training in this particular and all-important branch of the profession. What a difference it would make !

## MITRAL STENOSIS.

*Dr. C. Lian.*

(*Translated by Carey F. Coombs, M.D., F.R.C.P.*)

The diagnosis of mitral stenosis is too often made where there is not the least trace of a mitral lesion. Usually this mistake is based on the belief that a faint presystolic bruit is heard, with or without an accompanying thrill. Three cases of this kind are reported by E. E. Irons and A. F. Jennings.[1] Autopsy showed that no mitral lesion was present.

Recently the writer[2] has shown that it is dangerous to found a diagnosis of this lesion on a supposed presystolic murmur. " It is by no means rare, especially when the heart is quick or irritable, to find, in healthy persons, that the first sound is crescendo in character instead of consisting of a single sound, and gives the impression of a sound rising from a soft beginning to a harsh termination. Now the presystolic bruit, ending as it does in a banging first sound, is crescendo in character, and has been described by many British and American writers as the crescendo murmur. There may, therefore, be a very close similarity between the crescendo first sound and the crescendo murmur, and the only point of distinction is that of localization in the cardiac cycle, which is a difficult distinction to draw. The right line to take is to refuse to admit the existence of a presystolic bruit due to mitral stenosis except when the bruit is so prolonged as to leave no doubt of its presystolic origin."

The same may be said of the presystolic thrill, for in some people without mitral stenosis the apex beat may convey to the palpating hand an impression of vibration easily mistaken for a slight presystolic thrill.

To aid in the diagnosis of this lesion, the writer[3] strongly advises examination with the patient lying on his left side. This brings out with increased clearness all the apical signs. Both the diastolic rumble and the accompanying thrill are almost always found when the patient is so examined.

All these counsels of prudence are the more justified because the actual time-relation of the crescendo bruit of mitral stenosis is again a matter of controversy; most writers call it presystolic, some call it early systolic. The argument for the classical theory (disappearance of the presystolic bruit when the auricle goes into fibrillation) has just been contradicted by Josué.[4]

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1922, i, 157; [2]*Bull. Méd.* 1921, Feb. 16, 147, and *Traité de Pathol. Méd.*, Sergent, 1922 (Maloine, Paris); [3]*Presse méd.* 1921, May 18; [4]*Bull. Soc. méd. Hôp.* Paris, 1922.

## MULTIPLE SCLEROSIS. *J. Ramsay Hunt, M.D.*

With the etiology and pathology of multiple sclerosis still subjects of controversy, and spontaneous remissions or intermissions as characteristic features of the disease, Byrnes[1] says the beneficial results claimed for any form of therapy are likely to be regarded with a degree of scepticism. That there is a striking analogy in the symptomatology and pathology of insular sclerosis and certain types of cerebrospinal syphilis is generally admitted; and yet medical opinion is quite unwilling to entertain an idea that syphilis may be an etiological factor in disseminated sclerosis. Often a patient supposed to be suffering from multiple sclerosis exhibited symptoms known to occur in cerebrospinal syphilis, and occasionally a positive Wassermann report necessitated a revision of the diagnosis. The Wassermann test is not, however, uniformly positive in clinical syphilis, so that failure to secure laboratory confirmation of syphilis in all of the cases is no proof that syphilis may not be an etiological factor in this strikingly analogous affection.

The author reports five cases bearing on the relation of syphilis and multiple sclerosis, but states that there are features in the clinical records on which one may defend the position that they are only instances of certain types of cerebrospinal syphilis; that a diagnosis of multiple sclerosis is not warranted, since there is a history of syphilis in the first case, a positive Wassermann reaction was obtained in the fifth patient, and the classical symptoms of nystagmus, scanning speech, and intention tremor are not invariably present. The history of a venereal sore does not necessarily establish its syphilitic nature, nor does a negative laboratory report preclude the possibility of syphilis. The triad of Charcot has also been observed in unquestioned syphilis of the nervous system, and in multiple sclerosis it is often a late if not uncommon syndrome. The cytology of the two diseases is often quite identical. Schuster has also made a significant observation. He finds, in certain cases of disseminated sclerosis, that the lesions are most commonly situated in what he calls the boundary zone of the cortex, and claims to have demonstrated *Spirochæta pallida* in this zone, in a genuine case of multiple sclerosis. It was in this region, also, that the organism was most frequently observed in the paretic brain; and Igersheimer's demonstration of *Sp. pallida* in the atrophic optic chiasm in tabes and paresis deserves considerstion. Similar observations have been made by Plaut, Sarr, and Sarthof, and Spiller has reported as many as 200 lymphocytes per c.mm. in the spinal fluid. The Wassermann examination was not made. Burr found the blood and spinal fluid Wassermann-negative, but a paretic gold curve is often observed in multiple sclerosis.

Within the last eight years, multiple sclerosis has been subject to experimental investigation in an effort to establish its infectious nature and the character of the specific organism; but the results have been inconclusive.

Byrnes' conclusions are as follows: No organic disease of the central nervous system so closely resembles syphilis in its symptomatology and pathology as does multiple sclerosis. In all probability, the lesion in insular sclerosis is of an inflammatory nature. The cellular reactions are quite similar to those of syphilis; and, with the exception of the Wassermann test, the spinal fluid exhibits changes comparable with those in the vascular and gummatous types of cerebrospinal syphilis. Failure to demonstrate *Spirochæta pallida*, or to secure a positive Wassermann reaction in all cases, is no proof that syphilis may not be an etiological factor. Evidence of this nature is not infrequently wanting in tabes dorsalis, and occasionally in general paresis. A positive Wassermann reaction in multiple sclerosis does not, however, establish its specific nature, since the two affections may exist simultaneously, or else the disease is, in such instances, syphilis and not multiple sclerosis.

The therapeutic test is of no value as a diagnostic measure, since ineffectual treatment does not disprove a syphilitic factor, nor does effective therapy establish its presence. Tabes does not always respond to antisyphilitic therapy, and in general paresis the results are most discouraging. Thus, in the antisyphilitic treatment of multiple sclerosis, it may be argued that the affection is probably syphilitic, that there is a combination of the two diseases, that the intermission is spontaneous, or that the arsenical and mercurial preparations are useful drugs in the treatment of multiple sclerosis. Although syphilis may not be an etiological factor, there are undoubtedly clinical types of disseminated syphilis that are indistinguishable from insular sclerosis ; and until the etiology of the latter disease is established, or a more acceptable form of therapy devised, the adoption of **Antisyphilitic Treatment** is worthy of consideration. Treatment is more likely to be effective if begun early, and both intravenous and intradural medication are recommended. **Mercury** and the **Iodides** may be prescribed to advantage.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1922, March 25, 867.

## MUMPS.

*J. D. Rolleston, M.D.*

Epidemiology.—C. G. Sinclair[1] states that the incidence of mumps in the United States Army in peace time is usually below 10 per 1000 strength, but that in war years the rate becomes excessive. During the period 1917–19 231,490 cases of mumps were reported in the United States Army, representing 6·5 per cent of all admissions. The incidence of mumps was thus only exceeded by that of influenza. The Southern States, with their susceptible rural population, showed the highest rates, and the New England and Eastern States, which furnished a large proportion of urban recruits, the lowest, while the Central and Western States occupied an intermediate position. Sinclair points out that naval and military life, especially in war time, provides just the requisite conditions for the transmission of the disease, viz., massing of susceptible material, and frequent, direct, and intimate contact of individuals. As regards season, mumps shows a distinct preference for the winter and spring months. In the United States Army the highest rates for a period of ten years (peace time) were invariably found in March and April, and the lowest always in the autumn.

Symptoms and Complications.—E. Schwarzkopf[2] records an example of a rare variety of mumps which is characterized by the disease being localized in the submaxillary gland on one or both sides without any involvement of the other salivary glands. In Schwarzkopf's patient, a girl of 11, the condition was first mistaken for a hæmatoma and then for a glandular swelling of dental origin. The final diagnosis of submaxillary mumps was confirmed by the child's mother subsequently developing a typical attack of epidemic parotitis.

According to L. W. Farnam,[3] who reports a personal case, the *pancreatitis* which sometimes complicates mumps is more frequent in boys and young men than in other classes of the population. It usually follows, but it may precede, the parotitis, or it may be the only manifestation of the disease. The symptoms are intense epigastric pain, often vomiting, occasionally diarrhœa or constipation, and a slight rise of temperature. A lump may sometimes be felt in the epigastrium. The pancreatitis usually runs a short, benign course, and the internal secretion of the pancreas has not been known to be affected. Although as many as 119 examples of this complication of mumps have been reported, in only one case, which was recorded by Lemoine and Lapassat, was an autopsy held which furnished objective evidence of the disease, the diagnosis in all the other cases being based on more or less definite clinical signs. In Farnam's case, which occurred in a man of 23, symptoms of pancreatitis developed on the fifth day of an attack of mumps. Laparotomy, which was performed about ten days later, revealed an acutely inflamed pancreas, with large quantities of peritoneal exudation from which the organism isolated was *Streptococcus viridans*. Recovery was uneventful. This is the only example on record of mumps pancreatitis being verified by operation.

According to M. Labbé and R. Debré,[4] who report an illustrative case, *transient diabetes mellitus* following mumps pancreatitis has been recorded by several previous writers. Their own case was that of a man of 20, who eighteen months after an attack of mumps pancreatitis developed an erosion of the balano-preputial groove, suggesting the presence of glycæmia. Examination of the urine showed 4 grm. of glucose per litre. Reduction of the carbohydrates in the diet caused a very rapid disappearance of the glycæmia and cured the genital lesion, although the presence of metabolic changes in the form of urobilinuria, acidosis, and slight albuminuria showed that the hepatic functions were affected.

Reverchon, Worms, and Delater[5] report a fatal case of *laryngeal œdema* following an ordinary attack of mumps in a man of 40. Although only a few similar cases have been recorded, the writers maintain that the complication is more frequent than might be supposed, as they have observed two others at the nose and throat department of the Val-de-Grâce Hospital in Paris within the last six years. In the first two cases the symptoms were extremely mild. In each case the laryngeal œdema was situated in the posterior part of the vestibule, and was associated with involvement of the submaxillary gland, from which the œdema readily spread in the loose connective tissue to the larynx.

A fatal case of *purpura hæmorrhagica* following mumps is reported by Leduc[6] in a five-year-old girl. Death took place on the fifth day.

TREATMENT.—In a criticism of Salvaneschi's prophylactic treatment of mumps orchitis by injection of **Diphtheria Antitoxin** (*vide* MEDICAL ANNUAL, 1922, p. 284), F. Carrieu[7] remarks that before compiling statistics tending to prove the value of the method, it is advisable not to employ it in all cases in an epidemic, as the frequency of orchitis varies considerably in different epidemics. In 30 selected cases in which he adopted this prophylactic treatment, the frequency of orchitis (6 cases, or 20 per cent) was higher than among 57 not so treated (10 cases, or 17·5 per cent). He therefore concludes that injection of diphtheria antitoxin does not give sufficiently definite results to justify its employment in the prophylaxis of mumps orchitis in view of the possible risks of anaphylaxis.

H. Mallié[8] found that intramuscular injection of **Electrargol**, followed half an hour later by a cachet of 50 cgm. of aspirin, had a distinctly curative action on mumps orchitis without exposing the patient to the risk of anaphylaxis. It did not, however, appear to have any preventive effect, as orchitis developed in 3 out of 32 men who received prophylactic injections.

REFERENCES.—[1]*Military Surgeon*, 1922, 626; [2]*Wien. med. Woch.* 1922, 934; [3]*Amer. Jour. Med. Sci.* 1922, i, 859; [4]*Bull. Soc. méd. Hôp. de Paris*, 1921, 1306; [5]*Paris méd.* 1922, i, 471; [6]*Clinical Jour.* 1922, 140; [7]*Presse méd.* 1922, 292; [8]*Jour. de Méd. de Bordeaux*, 1922, 12.

## MYOMA.

*W. E. Fothergill, M.D.*

**Radiological Treatment.**—S. Kjaergaard[1] gives details of 84 myomata treated by *x* rays since 1912 and followed up. One died during treatment, one died later of sarcoma of the uterus, and another of cancer of the ovary. In 73 of 77 patients permanent amenorrhœa was produced, and as regards the control of bleeding the results were very good. As to the other aim of the treatment, namely the disappearance of the growths, less was secured. The tumours seldom remain as large as before treatment, and in some cases the decrease is surprising, but it is very variable. Artificial menopause symptoms also varied much, and lasted from one to three years in many cases. There is a possibility of skin lesions as a complication. No deleterious effect on the bladder or intestine was observed. Evanescent malaise and nausea were not uncommon. The results, though satisfactory in general, cannot be compared with those of successful removal of the growths, and it is the risk attending operative treatment that alone gives radiation its chance. The mortality of operations for myoma in Copenhagen at the present time is calculated by the author as maximum 5·5 per cent and minimum 4·2 per cent; for supravaginal hysterectomy alone, 3·9 per cent. Is there any risk of death in connection with *x*-ray treatment? The writer has had one death. Albers and Schonberg have recorded two deaths. Extrusion and necrosis of submucous fibroids during treatment has been observed, and has led to certain fatal results. Acute salpingitis during treatment has demanded operation under unfavourable conditions, with grave risk and some deaths. Mistakes of diagnosis may have serious results, or may only lead to loss of time and money. However, it is not correct to regard *x*-ray treatment as free from risk. Again, operative treatment may be demanded after *x*-ray treatment has stopped bleeding, on account of pressure symptoms, degenerations, infections, and malignant changes. *X*-ray treatment is out of the question in infected and necrotic, twisted, and incarcerated fibroids, during pregnancy, and in cases of intraperitoneal bleeding, as in all cases of submucous fibroids. This treatment should be avoided in inflammatory conditions of the appendages, and in the presence of ovarian or other tumours, including, of course, malignant growths of the cervix or corpus uteri and other organs. Large fibroids and those causing pressure symptoms should be treated by operation, and marked anæmia should be treated by transfusion before radiation is employed. The age of the patient is important: she should be over 40, but should not have passed the menopause, as fibroids which cause bleeding after the menopause should be removed. The patients best suited for *x* rays are those over 40, but before the menopause, with bleeding as the main symptom, the tumours not too large, and accessible to examination complete enough to exclude complications and errors of diagnosis. These are a minority, the surgical cases being the more numerous.

G. Gellhorn[2] gives his answer to the question when to operate and when to use radium for myomata. He considers the *x* ray much inferior to radium for this purpose. Radium has its principal field in women over 40 whose fibroids do not extend above the umbilicus, and they should be interstitial rather than subserous or submucous. After these cases come those who are poor surgical risks through anæmia, renal and cardiac disease, tubercle, or high blood-pressure, and very stout women. Thirdly come those who are opposed to any form of surgical treatment. Lastly, radiotherapy is suitable for women over 40 who have fibroids causing no symptoms at all. The advantages of radiotherapy are said to be: (1) Cure of over 60 per cent of all cases coming for treatment; (2) No mortality, as against 3 to 5 per cent mortality after operations; (3) Insignificant morbidity; (4) Less expensive than operation. Surgical treatment is the more suitable for all tumours extending above the umbilicus, and likewise all large subserous and submucous growths. Cervical fibroids should also be removed, as well as those that are suppurating, necrotic, or gangrenous, and those which are undergoing degeneration. Women under the age of 40 should have surgical treatment, as should those whose fibroids are complicated by ovarian tumours and infections of the appendages. "The man who admininsters radiotherapy indiscriminately, disregards the best interests of his patients as much as the man who adheres exclusively to surgery."

The above are examples of a very large group of recent communications on a subject which demands full consideration. The radiotherapy of uterine hæmorrhage without ascertainable cause is much less important, because it can do much less harm than the radiotherapy of unsuitable myomata. It may be tried freely until results have accumulated. The radiotherapy of uterine cancer must also be fully tested through a prolonged series of years to see whether it will not, in operable and inoperable cases alike, give better results than operative interference. In short, when submitting fibroids to radiotherapy, the cases must be carefully selected now; whereas, in dealing with cancer and with mere hæmorrhage, selection of cases is of relatively minor importance at present.

REFERENCES.—[1]*Acta Gynecologia Scandinavica,* 1922, i, Fas. 2, 191; [2]*Jour. Amer. Med. Assoc.* 1922, Jan., 259.

## MYOMA OF RECTUM. (*See* RECTUM, MYOMA OF.)

## MYOSITIS AND FIBROSITIS.

*Charles E. Sundell, M.D., M.R.C.P.*

Rosenow and Ashby,[1] in an important paper, strongly support the infective origin of myositis. They report the detailed study of 28 cases; of these, 24 had septic foci in teeth or tonsils, and improved greatly after these had been suitably treated. The organisms found in these foci produced lesions in animals similar to those in the patient from which they had been isolated. In one case which did not show any improvement in his muscle condition after the suspected septic area had been treated, the organisms derived from this area failed to produce muscular lesions in the animal into which they were injected. These observers have succeeded in isolating anaerobic streptococci from muscular lesions in man and animals. Control cultures from the blood of these cases were often sterile at the same time that muscle cultures were successful. The strains of organisms from cases with generalized myositis tended to produce numerous small lesions in animals; those from localized myositis produced only a few localized muscular lesions in animals. Of rabbits injected with tonsil-pus from patients with myositis, 94 per cent developed lesions in the muscles; of rabbits injected with pus from the tonsils of patients who were not the subjects of myositis, only 12·5 developed muscular lesions. The changes which they describe in the human muscles in acute cases are extravasation of red cells, interstitial swelling, swelling of muscle fibres, with necrosis and disappearance of transverse striation (*Plate XXVIII, A*). Streptococci can be found on direct examination (*Plate XXVIII, B*). In the chronic stage there is marked endothelial swelling and plugging of vessels, and little cellular infiltration; streptococci can be found only with great difficulty, but they can be cultured from the area of the lesion. The writers note that in some cases of experimental infection leading to necrotic areas of considerable size, calcification was apparent within a few days of infection.

*Lumbago.*—Llewellyn[2] regards lumbago as a manifestation of gout rather than of rheumatism, and attributes the attack to specific protein anaphylaxis excited by proteins absorbed from the bowel while in a state of inflammation

# PLATE XXVIII.

## ACUTE RHEUMATIC MYOSITIS

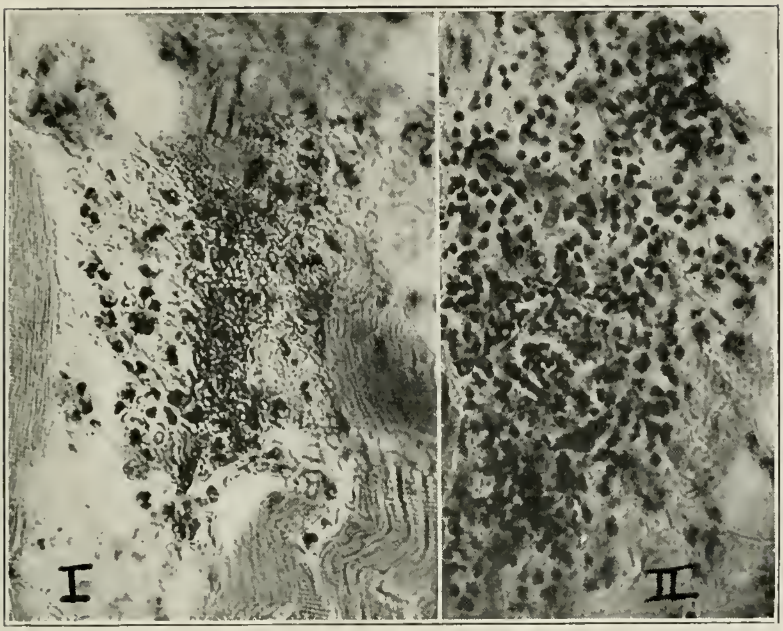

*Fig. A.*—(I) Hæmorrhage and leucocytic infiltration within and between the muscle fibres in the excised muscle in a case of acute rheumatic myositis in man. Hæmatoxylin and eosin (× 200). (II) Marked leucocytic infiltration in an excised section of muscle from the forearm of a patient with acute localized myositis. Hæmatoxylin and eosin (× 200).

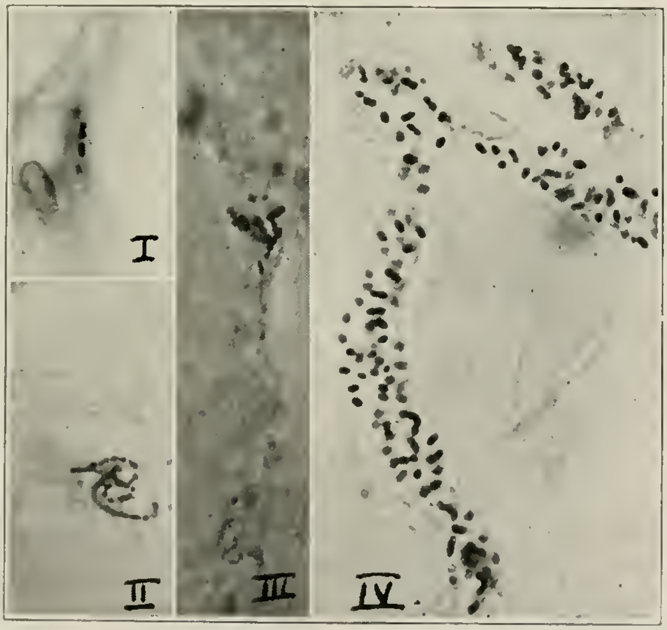

*Fig. B.*—(I) Chain of two diplococci in the section of human muscle shown in *Fig. A* (I). Gram-Weigert (× 1000). (II) Chain of streptococci in the area of leucocytic infiltration shown in *Fig. A* (II). Gram-Weigert (× 1000). (III) Diplococci in area of leucocytic infiltration. Gram-Weigert (× 1000). (IV) Large number of Gram-positive diplococci in capillaries of a hæmorrhagic area in the quadriceps tendon of a rabbit two days after injection with the streptococcus from the tonsils in a case of peri-arthritis and myositis. Gram-Weigert (× 1000).

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or irritation. He believes that its occurrence so commonly after muscular effort can be explained by the effect of local acidosis upon the cells of the part; this acidosis produced by the lactic acid output of active muscle may exert an influence upon the cell which renders it sensitive to the exciting protein. As examples of subtle environmental influence in support of his hypothesis, he quotes Hamilton's discovery that the blood of the sheep will grow the bacillus of 'louping ill' freely in the spring, but at all other times of the year is strongly bacteriolytic to this organism. He quotes also Wright's observation that the gas bacillus will not grow in human blood unless traces of lactic or carbonic acid are present.

The sudden onset of lumbago could certainly be well explained by anaphylactic shock, the production of which is associated with sudden spasm of arterioles, and dilatation of venules, resulting in venous stasis and acute cramp. The paper is a valuable summary of the differential diagnosis of lumbago.

Sicard and Forestier[3] recommend **Laminectomy** for chronic rheumatic lumbago. They describe the '*psoas sign*', consisting in pain on rotation inwards of the extended thigh, and state that this can only be obtained if spinal osteophytes are present. They regard it as a contra-indication to laminectomy. The type of lumbago which they describe is intermittent at first, and then becomes constant. It is associated with spasm of the erector muscles, so that the lumbar concavity persists when the patient stoops. Nothing abnormal can be seen with the $x$ rays, and the cerebrospinal fluid is normal. The pain is ascribed to pressure upon the trunks of the spinal nerves as they pass through the foramina of exit from the spinal canal. If laminectomy is performed, the dural sheath is seen to be traversed by transverse bands running between the ligamenta subflava. Removal of the arches of the vertebræ gives immediate relief to the pain and spasm, and in no way interferes with spinal strength or movement. They claim cures in cases of two and a half to eight years' duration, which have resisted all other forms of treatment, and express the opinion that their operation may prove to be useful even in some cases of arthritis of the spine with osteophytic outgrowths.

**Massage in Fibrositis.**—Marlin[4] recommends immediate massage at the commencement of the disability. He says that the patient can localize the tender spot with precision, and that here a gentle rolling palpation with the finger-tips will reveal a fibrous strand or nodule which on further manipulation yields to massage and disappears. He holds that, to be effective, massage must be continued in these cases till this satisfactory result is obtained, and advises treating a small area at a time with the aim of giving considerable or even complete relief, rather than attempting to relieve a larger area. He points out that if one movement can be rendered painless the patient will be encouraged to undertake others for himself, and in doing so provide massage for the other painful areas.

References.—[1]*Arch. of Internal Med.* 1921, Sept., 274; [2]*Med. Press*, 1922, April 26, 355; [3]*Presse méd.* 1922, Jan. 18, 45; [4]*Practitioner*, 1922, June, 425.

## NÆVI.

*E. Graham Little, M.D., F.R.C.P.*

Molesworth[1] recommends application of **X Rays** or **Radium** for nævi in infants under six months of age. In suitable cases the method of procedure is as follows: A three-quarter or a full erythema dose of medium to hard (four to six B.W.) $x$ rays is delivered in one sitting. The surrounding skin is protected either by a suitably-sized localizer or by a sheet of lead foil or lead rubber tissue with a hole the size of the nævus cut into it. At the end of ten days there is generally a noticeable engorgement of the nævus, which is quite transitory, and is followed a week later by distinct flattening and paling of the growth.

Three or four weeks after the first application a second dose may be administered; this often results in complete disappearance. A third or even a fourth application may be required; but if full erythema doses have been given it is rarely necessary to continue further. In his opinion, nævi which resist treatment partly or entirely by this means should be dealt with by other methods, e.g., carbonic acid snow. (*See also* NEW GROWTHS,)

REFERENCE.—[1]*Med. Jour. of Australia*, 1922, May 23, 576.

## NAILS, DISEASES OF. (*See also* RINGWORM.)

*E. Graham Little, M.D., F.R.C.P.*

Rosenau[1] has found a curious *pitting of the nail*, with which we are all familiar in psoriasis, present in a very large percentage of cases suffering from rheumatism with endocarditis, from chorea, and from tuberculosis. In the latter the pitting is often associated with furrowing of the nail and clubbing.

*Onychauxis.*—Alderson[2] describes a remarkable case of overgrowth of all the finger nails and most of the toe nails in a woman, age 49, with general coarseness and dryness of the skin, and severe pruritus. She gave a positive Wassermann reaction. Small doses of **Thyroid** (and no other treatment whatever) were given. The nails had completely recovered five months after beginning this treatment (*Plate XXIX*).

*Verrucæ.*—Ayres[3] recommends the use of **Radium** for subungual warts. The method used is thus described: The nail was pared down over the lesion as closely as possible without causing pain. The normal tissue was protected by lead foil. A square, half-strength applicator, containing 5·5 mgrm. of radium element, was applied, with only paper screening, for twenty minutes. Two subsequent exposures of forty and thirty-five minutes respectively were given at two-week intervals, making a total of ninety-five minutes. There was no unusual discomfort at any time, and the greatest amount of reaction consisted only of a mild erythema and scaling. Two months after the last treatment, not a trace of the lesion could be seen.

REFERENCES.—[1]*Jour. Amer. Med, Assoc.* 1922, June 10, 1783; [2]*Arch. of Dermatol. and Syph.* 1922, May 1, 602; [3]*Ibid.* June, 748.

## NAPKIN RASH IN CHILDREN.

*E. Graham Little, M.D., F.R.C.P.*

Cooke[1] was able to show that the irritative rash common in infants wearing diapers is due to the presence of a urea-splitting organism in the stool which resulted in the liberation of ammonia in the diaper, and that this could be prevented by the use of an antiseptic such as **Mercuric Chloride.**

REFERENCE.—[1]*Lancet*, 1921, ii, 1288.

## NASAL ACCESSORY SINUSES.

*A. J. M. Wright, M.B., F.R.C.S.*

**Accessory Nasal Sinusitis of Children.**—Further investigation seems to confirm the views given in the MEDICAL ANNUAL of 1922, p. 285, that this condition is more common than is usually thought to be the case. Mollison[1] investigated the condition of the maxillary antra in 102 children on whom operation for the removal of tonsils and adenoids was being performed. Their ages ranged from two to sixteen years. The symptoms consisted of frequent colds, nasal obstruction, earache, deafness, and purulent nasal discharge. The antra were explored with the syringe and curved needle. Infection, as shown by the presence of mucopus, was found in 20 per cent. In the majority of cases removal of the tonsils and adenoids is sufficient to clear up the symptoms, but sinus infection accounts for some of the cases in which this operation is apparently unsuccessful. Cleminson,[2] in a study of 85 cases of children three to fourteen years old, gives very similar conclusions. In a great majority the

# *PLATE XXIX.*

## ONYCHAUXIS

(ALDERSON)

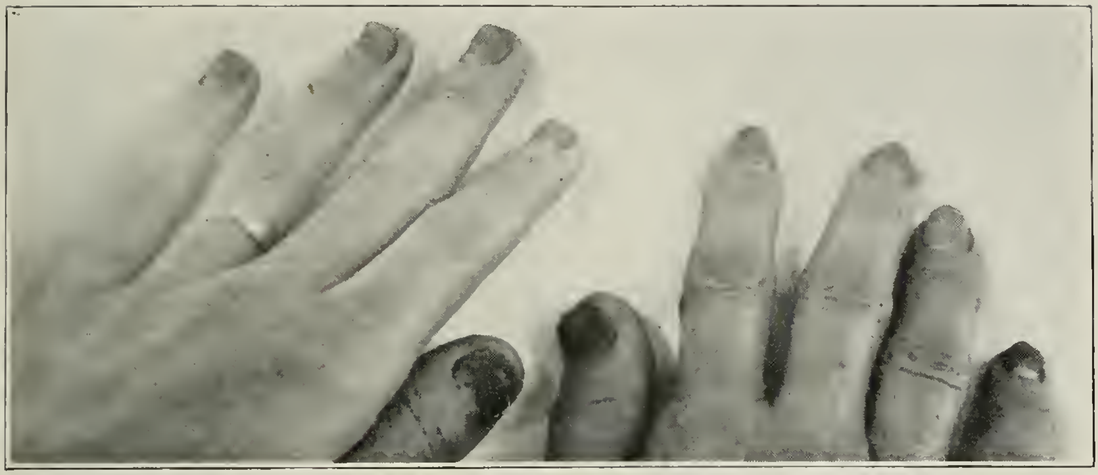

*Fig. A.*—Before Treatment.

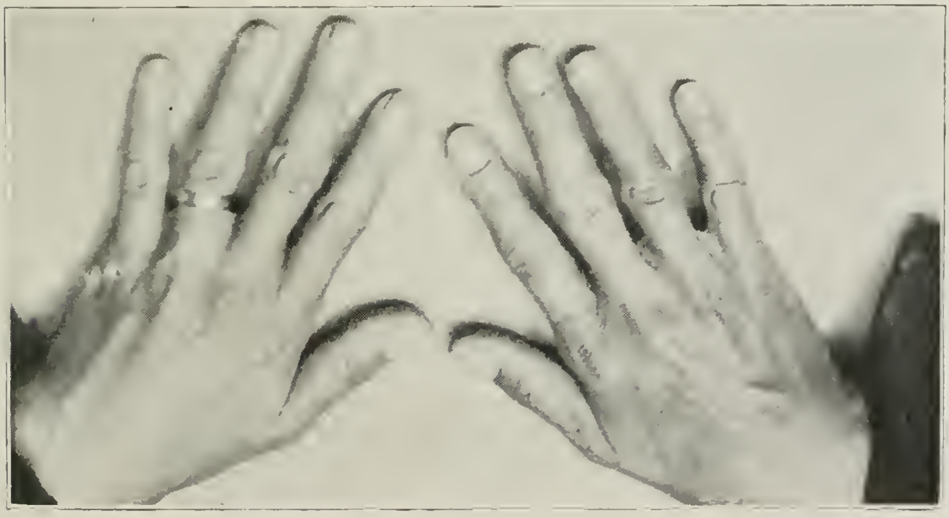

*Fig. B.*—After treatment.

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antrum is involved, and in a few, in addition, the ethmoidal cells and frontal sinus. Pus or watery fluid is to be seen in the nose, and frequently there is excoriation of the nostrils and congestion of the turbinals, particularly the middle. The diagnosis rests on the presence of these symptoms in conjunction with results of transillumination, radiography, and exploratory puncture. The small size of the antra in the youngest children renders transillumination less valuable and exploratory puncture more difficult. In those few cases which do not clear up with simple removal of tonsils and adenoids, an intranasal operation on the antrum is effective. Headache is an important symptom by which to differentiate a case of sinus suppuration from simple adenoids.

**Mucocele.**—This condition is not a very rare one, but is frequently overlooked. It is probably due to an accumulation of secretion in the sinus affected, owing to obstruction of the outlet, with resulting expansion. It may result from inflammatory changes in the sinus, or more probably in many cases, according to Howarth,[3] from trauma. The frontal and ethmoidal sinuses are those most frequently involved. The condition is characterized clinically by a firm, rounded, painless swelling in the inner angle of the orbit. This swelling may be bony hard, may crackle under the finger, or is occasionally fluctuant. The condition is essentially chronic, and may persist for years, gradually enlarging and displacing the eyeball. This displacement frequently gives rise to diplopia. In the case of frontal mucocele the swelling occupies the upper inner angle of the orbit; while if the ethmoid is involved, the swelling is lower down and is not infrequently diagnosed as lachrymal. Epiphora is a frequent sign. Intranasal examination frequently shows no abnormality. When diagnosed, these cases should be treated by an operation through an external incision, the formation of a free opening into the nose, and the retention of a tube for some days, with closure of the external incision.

**Malignant Disease of the Nasal Accessory Sinuses.**—Considerable progress has been made in recent years both in the diagnosis and surgical treatment of these cases. Musgrave Woodman,[4] in introducing a discussion at the Royal Society of Medicine upon the treatment of such cases, epitomizes the present opinions. These growths, as a whole, have essentially a local rather than a general malignancy, tending to recur rapidly after removal; but glandular involvement or metastases are uncommon. He suggests, in regard to degrees of malignancy of different varieties of growth, that cases of epithelioma should be submitted to operation, sarcoma should be treated by radium, and myxosarcoma, involving many sinuses, should be treated by operation, *x* rays, or both. Considerable care should be taken in the diagnosis of the extent of the disease before deciding on operation, and for this purpose a skiagram is very helpful, particularly for revealing extension to the frontal or sphenoidal sinuses. On palpation, a softened patch in the hard palate will give the earliest evidence of its involvement. Extension to the orbit, as evidenced by proptosis, is not necessarily a sign of inoperability. On the other hand, optic neuritis or atrophy is a sign of direct pressure of the growth on the nerve, and should preclude operation. A projection of the growth at the inner canthus of the eye is due to extension to the lachrymal sac, and can be dealt with by operation.

*Operative Technique.*—In the past these cases were treated by a set excision of the upper jaw. This operation has nothing in its favour, and should be regarded as obsolete. Operation in each case should be adapted to remove the growth, and not any particular anatomical structure. The most favoured method of approach is by means of some modification of Moure's operation, in which the nasal spaces are approached through an incision down one side of the nose, with removal of the requisite amount of bony margin of the nasal aperture. This operation can be extended, if necessary, either upwards to include the frontal sinus, or outwards on to the cheek to include the antrum, with, if necessary, removal of a greater or lesser portion of the upper jaw. Opinions are about equally divided as to the advisability or otherwise of ligation of the external carotid as a first step in the operation, and as to the relative merits of intratracheal anæsthesia or a laryngotomy during the operation. Post-operative applications of radium or *x* rays should be employed wherever possible.

References.—[1]*Guy's Hosp. Rep.* 1922, April, 225; [2]*Jour. Laryngol. and Otol.* 1921, Nov., 505; [3]*Lancet*, 1921, ii, 744; [4]*Jour. Laryngol. and Otol.* 1922, June, 287.

## NASOPHARYNX, MALIGNANT DISEASE OF.

*A. J. M. Wright, M.B., F.R.C.S.*

Owing to the inaccessibility and difficulty in examination of the nasopharynx, malignant tumours in this region are undoubtedly frequently overlooked until a late stage. New[1] has emphasized this fact in a review of 46 cases. The majority of his patients were males. In only 24 of them were nasal symptoms present, consisting of obstruction, hæmorrhage, and discharge. Eye symptoms were not infrequent, consisting of diplopia, dimness of vision, and ptosis. Earache, headache, or pain in the neck and jaw was also frequently complained of. The most frequent sign of all was the enlargement of the cervical glands, and in no less than 11 of the cases was operation on the glands performed without the primary disease having been discovered. One case, in addition, was operated upon for a supposed pituitary tumour, when really the condition was a direct extension from the nasopharynx. The lesson to be learnt seems to be that the nasopharynx should be carefully examined where the above symptoms are present, particularly if there are also enlarged glands in the neck. The upper cervical glands are always the earliest to be involved. Harrison[2] relates a case which illustrates this difficulty in diagnosis. Enlarged glands were removed from the neck of a woman, age 61, and it was not until some months later that pain in the throat, deafness in the left ear, nasal obstruction, and epistaxis, led to an examination of the nasopharynx. Radium would seem to hold out the best prospect of relief in these cases.

References.—[1]*Collected papers of the Mayo Clinic*, 1920; [2]*Jour. Laryngol. and Otol.* 1922, April, 188.

## NEPHRITIS. (*See also* Kidney Function Tests; Uræmia.)

*John D. Comrie, M.D., F.R.C.P.*

Pathology.—Some work has been done recently in regard to separation of the different anatomical types of nephritis as regards both their causes and symptoms. Major[1] publishes studies on a case of nephritis which followed the absorption of chromic acid and ended in death after thirty days. The kidneys showed a pure tubular nephritis. The findings as regards renal function tests had been a steadily increasing blood-urea up to 340 mgrm. per 100 c.c. on the day before death, an almost imperceptible excretion of phenolsulphonephthalein, and a poor urea concentration in the urine; the urine was of low specific gravity, and the amounts of urea, uric acid, creatinin, chlorides, and phosphate were all diminished; there had also been occasional glycosuria without increase of blood-sugar.

The relation of *tonsillitis* to nephritis has been investigated by Kayser-Peterson and Schwab[2]; they found that out of 479 cases of tonsillitis, nephritis followed the throat inflammation in 7·5 per cent. Pepper and Lucke[3] record a case of fatal chronic nephritis in a child with only one kidney; they emphasize the special danger which such persons undergo from the onset of nephritis, and make an exhaustive examination of the literature of the subject, from which they conclude that this congenital defect in development is not extremely rare, one kidney being absent in about every 3000 autopsies.

The effect of *high protein diet* has been investigated by Squier and Newburgh[4] clinically, both on 11 cases of nephritis and on a number of normal young men. They found distinct evidence that this acts as an irritant both to the normal and the diseased kidney; invariably, after forced high protein feeding, red blood-corpuscles appeared in the urine, and in cases of pre-existing kidney disease there were also increase of albuminuria, and sometimes increase of œdema and changes in the fundus oculi; over a short period, however, there was no resultant rise in blood-pressure.

The relation of *high blood-pressure* to kidney disease has been much discussed of late. The general assumption in the past has been that the high blood-pressure results from arterial hypertonus caused by kidney disease; but, with more general observation of the blood-pressure in all types of disease, it seems likely that in many cases the kidney disease results from damage to the renal capillaries caused by persistent stretching. Kylin,[5] from a study of the capillaries in the kidney, finds that in glomerulonephritis they become tortuous and swollen, while in diffuse interstitial nephritis the arterial system alone is involved, and hence the absence of œdema in the latter condition.

Morse[6] explains the origin of high blood-pressure in glomerular nephritis as follows: The primary condition is arteriosclerosis; if the kidney vessels are relatively spared, the condition is said to be one of hyperpiesis; if, however, the kidney vessels are affected, atrophic changes take place in the kidney, but, as the blood-pressure is rising all the time, more fluid is forced through the smaller number of glomeruli that remain, and so excretion of water and chlorides is maintained; on the other hand, there is nothing to compensate for the atrophied tubules, and hence retention of urea, etc., results. Pal[7] gives a somewhat similar explanation, and warns against interference, in the course of treatment, with the necessary driving pressure.

Turley[8] objects to the name chronic interstitial nephritis, which, although it describes the end-result of the pathological process, does not indicate the course of what is really an atrophy of parenchyma and replacement by fibrous tissue beginning in early life, to which the name senile nephritis would be better applicable. Moschcowitz[9] is of similar opinion, that clinically cases of chronic nephritis begin as cases of 'essential hypertension', and that if patients with the latter condition are traced over a long period they are found to develop clinical evidences of either general or local arteriosclerosis (cerebral, coronary, etc.), or renal arteriocapillary fibrosis (i.e., chronic nephritis). In a later communication,[10] he further develops the same idea by recording the pathological findings in five cases where hypertension and other clinical evidences of nephritis had been present, though only slight lesions were found in the kidneys of the nature of arteriocapillary fibrosis in the glomeruli. Bell and Hartzell[11] have made an exhaustive study upon the cause and development of glomerulonephritis in thirty-two fatal cases. They find that acute glomerulonephritis is nearly always due to some acute infectious process, usually a streptococcal infection; but that the great majority of chronic cases do not begin as frankly acute nephritis.

SYMPTOMS.—The subject of *classification* of the different forms of nephritis has always been a difficult one, and Floyd[12] contributes a paper in which he compares and criticizes the schemes respectively of Delafield (1903) and of Volhard and Fahr (1914). Both are formed on the basis of wide clinical experience verified by autopsies. They may be briefly summarized as follows :—

I. *Delafield* :—Acute Bright's disease—
  1. Acute congestion.
  2. Acute exudative nephritis.
  3. Acute degeneration.
  4. Acute diffuse nephritis.

Chronic Bright's disease—
  1. Chronic congestion.
  2. Chronic degeneration.
  3. Chronic diffuse nephritis.

II. *Volhard and Fahr* :—
  1. Degenerations ; affecting principally the tubular epithelium—nephrosis.
  2. Inflammations ; affecting chiefly glomeruli and stroma—nephritis.
  3. Arteriosclerosis affecting primarily the renal vessels—always associated with hypertension.

From the point of view purely of clinical appearances and chemical examination, Maclean[13] classifies Bright's disease into : (1) Acute Bright's disease ; (2) Chronic Bright's disease : (*a*) azotæmic type, (*b*) hydræmic type.

The question of *albuminuria* as a symptom, on the one hand of structural disease of the kidney, or on the other as a mere result of leakage, continues to attract considerable attention. Ballenger and Elder[14] divide cases of albuminuria combined with casts, according as these abnormal products disappear or not, within a week or two, when the urine is kept alkaline by 1-drachm doses of **Citrate of Soda** three times daily. They say they find most cases belong to the former mild group. Parmenter[15] found as the result of systematic examination of Harvard freshmen, that 5 to 7 per cent had albuminuria, but that after some weeks of training this disappeared in most cases ; he regarded it as a sign of deficient physical ability, but not as an indication of liability to future nephritis. Frenkel-Tissot[16] also examined the urine of 10 ski-runners after a strenuous competition in the Swiss mountains, discovering albuminuria in all, with casts in 8 and red blood-corpuscles in 3 ; but he regards this as a physiological phenomenon like fatigue, which is overcome by training. Rieser[17] gives an explanation upon an anatomical basis for the occurrence of orthostatic albuminuria. Briefly, his explanation depends on the fact that the left renal vein crosses the aorta in the angle beneath the origin of the superior mesenteric artery ; when therefore, through visceroptosis or similar cause, this artery is stretched, the left renal vein is compressed between it and the aorta, with resulting venous congestion of the left kidney, and albuminuria ; this albuminuria he finds can be abolished by wearing an appropriate **Belt.** Moor[18] found that intermittent albuminuria is very common in children (23 per cent of 397 examined), but that it is not a form of kidney disease.

*The recurring acute element in chronic kidney disease* is emphasized by Emerson[19] as of great importance, since it is the deteriorating influence in such cases. He urges that, in cases of chronic nephritis which show frequent slight rises of temperature, it is of the greatest importance to search for, and remove if possible, sources of recurrent infection. The same point has been elaborately studied in six cases by Ritchey,[20] who suggests that the downward course of chronic nephritis from which these cases suffered was determined by added acute processes with febrile symptoms.

Walters[21] records a case of nephritis with very low efficiency tests in which *Bence-Jones protein* was found both in blood and urine ; he states that 4 such cases have been found in approximately 32,000 patients examined at the Mayo Clinic.

*Renal dwarfism*, a condition of stunted development, associated with bone deformities of the late rickets type, and due to an insidious chronic interstitial nephritis of obscure cause, is described with records of ten cases by Barber,[22] who states that no account of the condition is to be found in any medical text-book.

PROGNOSIS.—*Nephritis of children* is discussed by James.[23] He considers that in acute nephritis the exudative type with œdema and diminished urine is less favourable than the acute hæmorrhagic type without œdema. He found that only 13 per cent of all acute cases pass into the chronic form, and that many patients even with chronic nephritis of a mild type ultimately recover. He considers that infections of the upper respiratory tract (tonsillitis, carious teeth, and otitis media) are specially deleterious to chronic nephritis.

Dyke[24] has followed up the histories of 100 cases of *war nephritis* after a period of four and a half years from the onset of the disease, with the following results : Complete recovery had resulted in 70 per cent before the lapse of one year ; most of the cases not recovered in that time became chronic ; the occurrence of uræmia at the onset had no unfavourable significance as regarded the late prognosis ; in chronic cases the tendency to death arises from circulatory and respiratory conditions, especially from pulmonary tuberculosis.

TREATMENT.—There are general principles in the treatment of nephritis upon which everyone is agreed, and which are applicable in all cases. Such, for example, are the rest and warmth of bed, maintenance of metabolism on a low plane, and stimulation of the excretory powers of skin and bowels by diaphoretic agencies and laxatives. Other points in therapeutics have changed considerably in recent years, and considerable differentiation of treatment has been adopted according to the type and stage of the degenerative renal process.

*Acute Nephritis.*—The plan of treatment pursued by most physicians is to maintain the patient for the first week or two, while blood and albumin are present in the urine, upon three pints of milk daily, and nothing else except water. One pint of milk with a quarter of a pint of cream was recommended some years ago by von Noorden in œdematous cases where it was desirable to restrict fluids ; and Petren[25] recommends a diet on similar lines, as follows : For the first four or five days the patient gets a mixture of equal parts of **Milk and Cream** only ; then fresh (unsalted) butter, potatoes, and rice are added, thus avoiding food rich in nucleins ; after several days more, bread and other cereals are given ; later, cooked fruits ; and finally eggs. Petren has had progressively improving results, and states that in his cases of acute nephritis before 1914 the albumin completely disappeared in 47 per cent, between 1914 and 1917 in 70 per cent, and since then in 94 per cent.

Dorner[26] recommends that at first the fluid intake should be restricted to 1 litre, and all nitrogenous foods debarred ; as soon as improvement begins, and whilst any œdema lasts, he advocates what he calls a **Sugar Diet**, consisting of $\frac{3}{4}$ litre milk, $\frac{3}{4}$ litre porridge made of rice, oatmeal, or other cereal, with unsalted butter, and cooked fruit. When œdema is marked, he has frequently found what he calls a **Water-freshet** (*wasserstoss*) effectual, that is, drinking $1\frac{1}{2}$ litres of tea within half an hour ; this may clear out the kidney tubules and restore the urine secretion to practically normal. Several other writers also commend this procedure.

*Chronic Parenchymatous Nephritis.*—It is necessary to divide the earlier stages (subacute) of this condition, whose chief clinical feature is dropsy, from the later stages, which share with the interstitial type as their main clinical feature a tendency to uræmia.

Hare,[27] among others, draws attention to the danger incurred by the patient if he is kept too long on a diet composed exclusively of milk. He loses flesh, but this may not be recognized, because fluid is accumulating in his tissues owing to inability of the kidneys to excrete chlorides, and consequent water retention. He also loses vigour, and becomes disheartened, and liable to succumb to infections. Such cases should at an early stage be put upon a **High-Protein** and **Salt-free Diet.** To determine whether a salt-free diet is advisable, he recommends the following test : the chlorides in the twenty-four hours' urine are estimated ; next day 5 grm. of common salt are given, and the chlorides excreted in the ensuing twenty-four hours again estimated ; kidneys capable of eliminating chlorides should get rid of this added excess in twenty-four hours ; if they do not, and dropsy is present, salt-free diet is indicated. Motzfeldt[28] also draws attention to the importance of finding out from the tolerance for chlorides how much the salt in the food should be reduced. McLester[29] concludes that the almost complete elimination of chlorides from the diet of nephritics accomplishes little if anything more than does the salt-poor diet ordinarily prescribed. He also found in some cases that serious results followed from drastic sodium-chloride starvation, e.g., distressing weakness and prostration, and in one case retinal hæmorrhages.

Ringer[30] opposes the idea, which undoubtedly is prevalent in the profession, that **Eggs** are specially harmful to nephritic patients. He advises the elimination of all meat soups and excessive salt from the diet, but considers that, when one begins to give protein food, eggs are as healthful as they are for any other patient. For a *patient at work* he allows the following **Moderate Protein Dietary,** which does not produce urinary nitrogen in excess of 10 or 12 grm. daily :—

*Breakfast.*—Fruit ; porridge with milk or cream ; bread and butter ; milk, cereal coffee (' Postum ').
*Lunch.*—1 or 2 eggs ; fruit salad ; bread, butter, and milk ; pudding, custard, or ice-cream.
*Dinner.*—Milk soups ; fish or meat—1 or 2 ounces ; vegetables ; salad ; bread and butter ; milk ; dessert.

If the patient begins to be troubled with headaches, dizziness, palpitation, and shows a further rise in blood-pressure, he recommends two weeks' rest in bed, free from business cares, with 15 gr. of **Bromide** three times daily ; and during this period the patient is put on a **Low Protein Diet** with smaller amount of food :—

*Breakfast.*—Stewed fruit ; porridge and milk ; one slice of bread and butter ; half cup of milk, hot water, and sugar.
*Lunch.*—Cream soup of celery, cauliflower, or tomato ; rice cakes ; green vegetables ; salad ; 1 slice of bread and butter ; half cup of hot water and milk ; dessert of pudding, custard, or ice-cream.
*Supper.*—The same as breakfast.

The question as to whether a **High Protein Diet** is advisable in certain cases has caused considerable discussion. There is a general prejudice against it, becauses it undoubtedly raises the blood-urea, and it is therefore presumed to throw more work on the already damaged kidney tissue, and because it is supposed to increase the albuminuria. With regard to the first contention, a high protein diet is of course inadmissible in cases with urea retention (azotæmic nephritis) found in chronic interstitial disease ; but the argument does not hold in cases of early parenchymatous nephritis. As regards the effect on the albuminuria, a considerable amount of research was done by Wordley,[31] who found that variations in the amount of protein in the diet had no effect on the amount of protein excreted in the urine ; in fact, if only percentage figures were taken, a rich protein diet might apparently decrease the albuminuria owing to the diuresis it provoked.

Epstein[32] holds the view that in nephritis the œdema is due to the lessened osmotic pressure of the blood brought about by loss of its protein through albuminuria; hence fluid transudes outwards through the capillary walls into the tissues, which absorb and retain it. He therefore supplies a greater amount of protein to dropsical cases, and finds marked improvement. Epstein's diet (food value, 1280 to 2500 calories) consists of: proteins, 120 to 240 grm.; fats (unavoidable), 20 to 40 grm.; carbohydrate, 150 to 300 grm. The actual foods he allows are lean veal, lean ham, whites of eggs, oysters, gelatin, Lima beans, lentils, split peas, green peas, mushrooms, rice, outmeal, bananas, skimmed milk, coffee, tea, and cocoa. The fluid is restricted to the quantity in the food plus what is necessary for the patient's comfort (about 1200 to 1500 c.c.), and the amount of salt allowed is the quantity sufficient to make the food palatable. Favourable results in diminishing œdema obtained by Epstein and others from this diet have been noticed in the MEDICAL ANNUAL for 1919, p. 275; 1920, p. 244; and 1921, p. 336.

The subject of **Diuretics** is somewhat a vexed one, as there is often a dilemma between allowing the dropsy to accumulate, or damaging the excretory powers of the weak kidneys by administering too irritating substances. Hare,[33] discussing this question in chronic nephritis with a severe exacerbation, uses the apophthegm, "You can no more force such a kidney to function actively by the use of diuretics, than you can force a consolidated lung to respiratory interchange by forced breathing"; but when some days have elapsed, giving time for the acute complication and congestion to subside, he considers that the use of a diuretic may be wise. His recommendation is to give the remedy in fairly full doses for a day or two; then to discontinue it; if no result follows, to wait for the kidney to recover further by natural processes: if diuresis results, to repeat the administration after two days' rest. He finds good results from $\frac{1}{100}$ gr. of **Nitroglycerin,** which he considers acts by dilating the renal blood-vessels and thus permitting increased secretion without stimulating the renal epithelium directly. If potassium salts be used, he considers this treatment should proceed with great care, because they are apt to be retained and act as a protoplasmic poison, so increasing œdema and cardiac depression. Blum, Aurel, and Lévy[34] speak favourably of their experience with **Potassium Chloride,** which has proved effectual when all other diuretics failed. They point out, however, that, if it is retained, the patients complain of nervous symptoms, weakness, fatigue, headache, and chilliness, and sometimes have dyspnœa, extrasystoles, and fall of blood-pressure. To avoid this, the dose must be kept below 5 grm. in the twenty-four hours; and they consider it well to test the tolerance first with 1-grm. doses.

Ringer[35] considers that when poor secretion of urine is due to cardiac decompensation accompanying nephritis, **Diuretin** given in doses of 20 gr. two or three times daily has a marvellous effect; but he does not advocate the use of diuretics at all in uncomplicated renal cases. Cheinisse,[36] in similar circumstances with great dropsy, speaks with the highest approbation of **Allyltheobromine** in doses between 20 and 80 cgrm. It has the advantage over salicylate of sodium and theobromine (diuretin) of being very soluble, and may therefore be administered by hypodermic injection, thus avoiding the gastric derangement which diuretin sometimes produces. Hirschfeld[37] points out that the action of diuretics depends a good deal on the diet; with a low protein diet diuretics act well, but when the diet is richer in proteins the same drugs may actually check diuresis.

It is sometimes noticed that uræmic symptoms with convulsions appear in cases of hydræmic nephritis without accumulation of blood-nitrogen (urea), especially in young persons with marked dropsy. Umber and Rosenberg[38] distinguish between these cases, to which they give the name of 'eclamptic uræmia', and true uræmia. They attribute the cause to œdema of the brain, and draw attention to the fact that **Lumbar Puncture** is the treatment indicated.

Epstein[39] draws attention to the fact that **Thyroid Feeding** produces a strikingly beneficial effect in some cases of nephritis, as if there were some thyroid defect present. The same effect has been noticed by other clinicians; but there is no indication as to how the cases likely to be benefited by this treatment may be recognized. The writer has observed that a beneficial effect is often produced in clearing up albuminuria occurring in elderly, stout persons with weak cardiac action, who may be supposed to be mild examples of myxœdema. Epstein also notes that the type of nephritis occurring in the war was regarded by many people as largely a vitamin-deficiency disease, and that, especially in children, this cause should be borne in mind as a possibility, and, where it seems likely, treated by food containing **Vitamins.**

**Decapsulation of the Kidneys** was performed to a considerable extent over twenty years ago in cases of advanced nephritis; but owing to want of success in the type of case to which it was then applied, it fell into disuse. Recently, however, the operation has been revived in connection with nephritis occurring in young persons and at an earlier stage of the disease. (*See* MEDICAL ANNUAL, 1921, p. 336.) Horder[40] gives an account of four cases in which decapsulation was undertaken for the treatment of subacute nephritis. The patients were 30, 10, 29, and 18 years of age respectively, and they had been ill before operation for periods varying from ten to eighteen months, with dropsy, albuminuria, anæmia, etc. In two of the cases no cardiovascular changes were discoverable; in the other two the heart was slightly hypertrophied and the vessels were somewhat thickened. All the cases made good recoveries from the operation; in the first two the health quickly improved and the urine became normal, the patients being in perfect health five years later; in the second two cases there was benefit in urinary secretion and general health, not, however, very marked. In a discussion at the Royal Society of Medicine, D'Arcy Power[41] said that the results of decapsulation in chronic interstitial nephritis and in old people were poor; and Tirard considered the results to be poor when there was advanced cardiovascular disease.

Boyd[42] records the results in two cases: one, a lad, having suffered from albuminuria and dropsy for three months, but having no sign of cardiovascular involvement; the other, age 41, having had albuminuria and very severe dropsy for ten months, with some dilatation of the heart but normal arteries. The first case showed a small amount of albumin persisting in the urine, but was in good health and doing full work three years later; the second case was in good health five months after operation, free from albuminuria, and his phthalein excretion had risen from 28 to 51 per cent. Vogel[43] records the results in 14 young persons upon whom he had performed decapsulation; of these, he states 9 were discharged cured, 4 died shortly after operation, and 1 was improved but lost sight of.

Fowler, Simpson, and Fraser[44] report 7 cases of decapsulation for nephritis in children. They consider that the indication for the operation is chronic parenchymatous nephritis with œdema as the main symptom; that children stand it well; that the benefit is so great as to justify the operation in all cases that do not improve under medical treatment; and that it is best to decapsulate both kidneys, on separate occasions. Kidd[45] gives the result of four cases on which he had operated; in one case the patient, age 14, was perfectly well four years after operation; in two cases there was marked improvement; the fourth case, age 27, with evident cardiovascular disease, improved for a few weeks, then relapsed, and died of phthisis and uræmia. Sanderson Wells[16] also records a successful case of decapsulation in two stages, and recommends the procedure both as an emergency operation in eclampsia, uræmia, suppression of urine, etc., and in chronic cases where prolonged medical treatment has failed. In either case the heart and arteries should be sound and the patient young.

*Chronic Interstitial Nephritis.*—In this type the most marked feature is the tendency to accumulation of nitrogenous waste products such as urea, and there are great cardiovascular changes, but not much œdema. The necessity for a low protein diet is universally recognized. Sansum[17] considers that high hydrogen-ion concentration in the body fluids plays a great part in the production of symptoms, if not in the original cause of the disease. This is a modification of the old theory of Fischer, which attributed nephritis generally to high urinary acidity. Sansum divides all foods according as they are acid-producing, base-producing, or neutral. He furnishes a long list in each class, with the percentage of excess in either direction, and he gives the following example of a **Basic (Alkaline) Diet** which is suitable for the maintenance of a patient with chronic interstitial nephritis. It will be observed that from another point of view this might be described as a **Low Protein Diet**:—

*Breakfast.*—Baked apple with cream; bacon; one slice of toast; butter; marmalade; orange-juice; coffee.

*Dinner.*—Cream soup; baked potatoes; beets in cream; salad; one slice of bread; butter; olives; pineapple cream.

*Supper.*—Scalloped potatoes; buttered peas and carrots; fruit salad; one slice of bread; butter; ice cream; cocoa.

Additional diets are allowed of milk at 10 a.m., fruit-juice at 3 p.m., and hot milk at 9 p.m. He notes that corn-starch may be used as a thickener for soups, etc., and that lemon-juice is substituted for vinegar as a salad dressing.

For high blood-pressure, which is an invariable accompaniment of this type of nephritis, Alder[18] recommends **Venesection** repeatedly applied, while **Pilocarpine** and **Papaverine** also produce beneficial results. In early cases with high blood-pressure and angina, Ringer[49] finds **Sodium Nitrite** in 1-gr. doses, or **Nitroglycerin** $\frac{1}{50}$ gr., gives excellent results; but he gets the best effect by simply putting the patient in bed for a week or two. In later stages he finds **Venesection** (withdrawing 300 to 500 c.c. of blood) followed by **Glucose Infusion** (300 to 500 c.c. of a 5 to 6 per cent solution) gives satisfactory results even when coma has set in.

Miller and Williams[50] have made researches upon the effect of excessive fluid intake on the blood-pressure. They gave patients with nephritis amounts of water up to 10 litres daily in quantities of 2½ litres at a time. It was found (by weighing) that the excess of water was excreted in twenty-four hours. The blood-pressure, which in one case rose from 190 mm. to 280 mm. at the close of the day, fell next day to 140 mm. No effect upon the blood-urea was produced at the end of six days of this excess of water intake. One may conclude from this that administration of water in large quantities has little therapeutic effect, and that in patients with high blood-pressure it is advantageous to **Limit the Fluid Intake.**

In the treatment of uræmic manifestations, Rémond and Menvielle[51] report seven cases that showed a decided change for the better under the influence of **Parathyroid Extract** treatment. Not only did the symptoms improve, but the blood-urea fell to less than one-half its previous amount. They gave injections of the extract every second day, and two cachets by mouth daily, and conclude that this combats uræmic intoxication.

The acidæmia of chronic nephritis, which is frequently shown by dyspnœa with little or no evidence of cardiac enlargement or decompensation, has been studied by Cornell,[52] who recommends the administration of four doses of **Sodium Carbonate** 20 gr. by mouth as usually effective in causing its subsidence or disappearance.

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## NERVES, PERIPHERAL, SURGERY OF. (*See also* Bones and Joints, Surgery of—Paralysis of Intrinsic Hand Muscles; Neuralgia.)

*J. Ramsay Hunt, M.D.*

The technique of nerve surgery is described by Ney.[1] He states that local anæsthesia has supplanted all other forms of anæsthesia in his clinic. It is of particular value in that analgesia is induced and motor power is retained. The technique consists in a careful intradermal injection of the line of incision, and a subcutaneous and deep infiltration of the operative area with a 1 per cent novocain solution containing 15 drops of adrenalin chloride (1–1000) to each 30 c.c. of solution.

**Torsion.**—Torsion of a nerve-trunk is a serious eventuality in nerve suture; its prevention, therefore, is an essential factor. Most peripheral nerves are mixed in function; certain funiculi subserve the function of motion, others that of sensation. Twisting of the nerve-trunk during its approximation by suture would affect a physiological misplacement of fibres—sensory fibres may be directed down motor channels, and motor fibres through sensory pathways—thus resulting in a physiological loss, i.e., defective sensory return and a diminution in motor restoration. The prevention of torsion in nerve suture may be attempted by several different methods, all of which have been used at various times in this clinic:—

1. *Identification Sutures* consist of placing a fine silk suture in both segments of the nerve proximal and distal to the lesion, and at a definite point in its circumference, before it has been completely dissected from its bed.

2. *Funicular or Bundle Matching* would be satisfactory to a high degree if it were possible to identify the physiologically different funiculi in both ends of the divided nerve ; but this is impossible in the upper end, and in the lower end the physiologically active element—the neuraxon—is missing. Therefore they have not been able to match bundles with any degree of success.

3. *Forceps Identification* has been very satisfactory, because the forceps are readily adjusted and very convenient for holding the nerve for section and later for suture.

4. *Anatomical Markings* are of value in that observation of the longitudinal striations will often serve to reveal a twisting of the nerve trunk. The course of blood-vessels will frequently give the same information.

**Nerve Defects.**—When the nerve has been dissected free from the scar tissue (which usually infiltrates the region of the injury and often extends some distance up and down the nerve-trunk), the end of the proximal segment is usually found to present a neuroma. The end of the distal segment seldom reveals any enlargement, but more often is found terminating in the scar tissue, from which it is often impossible to be differentiated. When the nerve is found to be completely divided, the indications are for the resection of the neuroma and scar tissue from its end until normal-appearing bundles are found. Nerve defects may be overcome by one of the following methods, or by their combination :—

1. *Primary Nerve Stretching* alone will overcome a certain number of defects. It is best accomplished by placing forceps on each end of the unsectioned nerve and, by exerting gentle traction, drawing the ends together.

2. *Flexion Relaxation* is used in most cases, and has proved itself of greater value than any other one method in overcoming nerve defects ; it is the secondary rather than the primary stretching which is utilized in this procedure. The nerve is relaxed by flexion of the governing joint, which will often permit the overcoming of a considerable defect—from 5 to 10 cm.

3. *Transposition of Nerve-trunks* from a deep to a superficial plane, or from an extensor surface to a flexor surface, will assist materially in overcoming certain defects. In all transpositions the greatest care should be exercised in the preservation of branches ; these usually have to be isolated and freed for some distance up the nerve-trunk in order to make the transposition possible without tearing or overstretching them.

4. *A Two-stage Operation* is used only for large defects which cannot be overcome by the usual methods, such as immediate stretching, flexion-relaxation, transposition, or a combination of these methods. The *first stage* consists of the usual exposure of the nerve, placing of identification sutures in its sheath for subsequent alinement, and freeing it from the surrounding scar tissue. The *second stage* consists in exposing the stretched nerve, which will usually be found elongated sufficiently to permit resection of neuroma and scar tissue ; and approximation and suture are accomplished by again flexing the governing joint. The limb is retained in flexion, this time for four weeks, as in the flexion-relaxation method, after which it is slowly allowed to extend.

5. *Grafts.*—In the past, various types of operations have been suggested for the overcoming of nerve defects, and not a few of these were doomed to failure because the fundamental principles governing nerve regeneration were ignored. Essential to the regeneration of the neuraxon is the directing activity of the cells of the sheath of Schwann in the distal segment. Ney's experience has led him to believe that, as a rule, nerve-grafts are not entirely satisfactory ; therefore at the present time he resorts almost entirely to the two-stage operation previously described, when the defect is too great for end-to-end suture at the primary operation.

*Preparation of a Nerve-bed.*—When scar tissue is prevalent he endeavours to transplant the nerve and obliterate the old bed. The preparation of the new bed in a neighbouring healthy muscle is, as a rule, only fairly satisfactory, and it is much better to use an adjacent scar-free intermuscular plane.

*Nerve Suture.*—The preparation of the nerve-ends for suture consists in the resection of the neuroma and scar tissue by removing thin cross-sections until normal-appearing bundles are found throughout the sectioned end.

*Partial Suture.*—Frequently a nerve may present only a partial neuroma, and faradic stimulation on the operating table may indicate that a portion of the nerve carries impulses; this is usually confirmed by the pre-operative clinical reports, which note the presence of voluntary power, faradic irritability, etc., in some of the muscles supplied by the injured nerve.

*Neurolysis.*—Neurolysis is directed toward the correction of physiological interruptions—those cases in which the anatomical integrity of the nerve is preserved, but where function is inhibited by its constriction; or they may be due to one of, or a combination of, several factors: (1) External compression by scar tissue, bone callus, or any form of pressure; (2) Thickening or infiltration of the nerve-sheath; (3) Interstitial fibrosis, due to the organization of an intraneural hæmorrhage, to infection, or to that type of fibrosis which occasionally follows ischæmia. Neurolysis consists in the removal of scar tissue or bone callus, which by virtue of its compressing effect produces a physiological inhibition of function. This procedure, as a rule, produces very gratifying functional results, and when completed should leave a nerve free of induration—the nerve at the point of operation should have the same consistency to palpation as the normal portions of the nerve.

*The Influence of Technique on Final Functional Results.*—While in all types of surgery the importance of specific technique is becoming more and more appreciated, there are few branches in which it is as important in regard to final functional results as in the surgery of peripheral nerves. Scar tissue, which is associated to a greater or less extent with all surgical interventions, is particularly important in reference to nerve surgery, and is often productive of a definite inhibitory influence on the functional return of motion and sensation. It is essential that the formation of scar tissue be eliminated to the greatest possible extent by the more refined methods of general surgical technique. In this particular, attention should be directed to hæmostasis and the removal of blood-clots; the avoidance of tissue trauma by making clean, sharp dissections, and avoiding as much as possible the crushing effect of hæmostatic forceps; the avoidance of wound infection by the use of a careful instrumental technique, and all proper protection from skin contamination. It is also important that all tissues which are not receiving immediate attention be protected and prevented from drying by the use of cotton pads which are kept saturated with warm saline solution.

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## NEURALGIA.

*J. Ramsay Hunt, M.D.*

Persistent pain in lesions of the nervous system is the subject of an interesting paper by Wilfred Harris.[1] For the sake of convenience he has arranged the causes in five classes, progressing from periphery to centre, or from nerve-ending to cerebral cortex:—

1. *Peripheral*, due to inclusion of nerve-endings in scar.
    a. For example, neurofibrositis, traumatic or rheumatic; adiposis dolorosa.
    b. Due to septic or to rheumatic terminal trigeminal neuritis: (i) Chronic paroxysmal trigeminal neuralgia (Fothergill's disease, tic douloureux); (ii) Chronic neuralgia of upper or lower jaw.

    c. Geniculate neuralgia.
    d. Glossopharyngeal neuralgia.

2. *Disease involving Nerve-trunks.*
    a. Supraorbital neuralgia.
    b. Multiple neuritis.
    c. Brachial or sciatic perineuritis.
    d. Tumours or gummatous neuritis: (i) Trigeminal; (ii) Spinal—for example, neurofibromatosis.
    e. Causalgia.
    f. Cervical or first-rib pressure.

3. *Lesions of Posterior Root Ganglia or Posterior Roots.*
    a. Post-herpetic neuralgia: (i) Trigeminal; (ii) Spinal.
    b. Tabetic neuralgia.
    c. Other root scleroses.

4. *Central Sclerosis of Fillet or Thalamus.*
    Intramedullary growths.
    Syringomyelia and syringobulbia.

5. Psychalgias.

1. **Peripheral Nerve Lesions.**—The pains of chronic or acute *fibrositis* of the lumbar or dorsal region, often known as lumbago and muscular rheumatism, are doubtless only too well known to many of us, though, so common as the affection is, its pathology is largely a matter of conjecture. Violent, and especially sudden, muscular action is the exciting cause in a considerable number of cases. Traumatic neurofibrositis may involve larger nerve-trunks, not nerve-filaments only, and sciatic perineuritis is a fairly common early sequel to fibrositis of the lumbar region, whether this is of rheumatic origin or due to a fall or other injury. As with sciatica, so brachial perineuritis may occur from muscular overstrain, or rheumatism and other toxic causes, such as pyorrhœa.

Chronic paroxysmal *trigeminal neuralgia* is certainly of peripheral origin, and is probably due to septic neuritis of nerve filaments in the maxilla or mandible. Another form of persistent trigeminal pain that he has seen many instances of is, in his experience, peculiar to young women. It is continuous, not paroxysmal, though it may vary in severity, and it affects either the upper or the lower jaw. It is not provoked by eating, laughing, washing, or other movements of the face, as is true of tic douloureux. It is more difficult to relieve by alcohol injection than spasmodic tic douloureux, inasmuch as total anæsthesia is necessary to abolish the pain, and with commencing regeneration of the nerve the pain recurs. Its cause is very uncertain, unless it is a chronic osteitis of the jaw.

*Geniculate neuralgia*, or neuralgia affecting the distribution of the sensory fibres contained in the seventh nerve, has been described by Ramsay Hunt, though some deny the association of the seventh nerve with such neuralgias. Transient pain around and behind the ear, lasting for two or three days, is a commonplace in association with the onset of facial palsy, and often precedes the motor paresis. Much rarer are instances of true herpes zoster affecting the auricle in association with facial palsy. The distribution of the herpetic rash is usually on the concha and antihelix, though it may be found behind the ear where the pinna joins the scalp, and also along the posterior wall of the exterior auditory meatus.

*Glossopharyngeal neuralgia* is a rare form of chronic paroxysmal neuralgia or tic douloureux. In its paroxysmal suddenness of onset, and in the severity of pain, glossopharyngeal tic is identical with trigeminal tic, for which it may easily be mistaken. Distinguishing it, however, from the latter, the pain in glossopharyngeal tic starts in the throat, in the region of the tonsil and anterior pillar of the fauces. The pain radiates to the ear, and especially just in front of the ear, along the back of the mandible, and into the upper part of the neck. Sicard records three cases of glossopharyngeal neuralgia, which were cured by surgical help in division of the nerve in the neck.

2. **Diseases Affecting Nerve Trunks.**—Paroxysmal *supra-orbital neuralgia* occurs daily, coming on about the same time, perhaps 10 or 11 a.m., and lasting until 5 p.m. Harris has seen this type follow influenza several times. Usually the pain is limited to the supra-orbital nerve, but it may involve the whole of the ophthalmic branch. Perhaps the majority of paroxysmal supra-orbital neuralgias are migrainous in type, for which alcoholic injection is of little or no use. In some subjects this migrainous periodic neuralgia is limited to the temple.

Chronic pain in the distribution of the trigeminal nerve may be due to *tumours* or *gummata* involving the sensory root of the fifth nerve within the skull, or one or more of its branches externally. Tumours in the ponto-cerebellar angle may irritate the sensory root of the fifth and simulate trigeminal neuralgia for years. Chronic pain in the arm and neck, running down to the inside of the hand, will usually suggest *cervical rib* as a cause, through pressure on the first dorsal nerve as it rises to join the inner cord. Wasting of the musculature in the hand and diminished sensibility along the inner border of the forearm to the wrist renders the diagnosis more certain. If a skiagram demonstrates a cervical rib, the position is clear. During the war the frequency of cases of persistent agonizing pain due to injuries of nerves, often slight, was most remarkable. The large majority of these cases (*causalgia*) involved the median or internal popliteal nerves, though the author has seen it also in the distribution of the ulnar, long saphenous, external cutaneous of the thigh, and radial nerves.

3. **Disease of Posterior Spinal Roots or Root Ganglion.**—*Post-herpetic neuralgia* is one of the most inveterate and difficult neuralgias we have to treat. Due in part to an inflammatory lesion in the root ganglion, in some cases to a neuritis of the nerve-trunk, and in others even to inflammatory changes in the grey matter of the posterior horn in the spinal cord, the pain is constant and wearing, causing great depression. With the pain is usually a severe numbness and sense of constriction, and the area of scarring is as a rule partially anæsthetic. *Tabetic pains* are too well known to need enlarging on here.

4. **Central Sclerosis of Fillet or Thalamus.**—Proceeding centrally, we find chronic neuralgic pain resulting from intramedullary lesions affecting the fillet and thalamus. Usually the pain is constant, burning and pins-and-needles in character ; but occasionally it is paroxysmal and neuralgic. It has been suggested that the persistent burning pain and paræsthesiæ in lesions of the thalamus or fillet are due to the spontaneous unrestrained activity of these nuclear centres for sensation. Similar pain is met with in some cases of syringomyelia and syringobulbia, the pain being referred to analgesic areas, an analgesia dolorosa. Intramedullary spinal tumours are also liable to cause a burning pain as an early symptom, which may precede for many months any more definite localizing signs.

5. **Psychalgia.**—Pain of mental origin is usually distinctive in character, such as the vertical pressure pain or clavus hystericus of some neurasthenic headaches. A mental neuralgia may usually be distinguished from a true neuralgia of peripheral origin by its distribution not being anatomical in form and overlapping other nerve areas, and especially in crossing the middle line.

With the psychalgias may, perhaps, be included many of the *coccygodynias*, though possibly in the majority of them there is a history of some local injury at the outset.

### Trigeminal Neuralgia.

*The Surgery of the Trigeminal Tract* is reviewed by Frazier.[2] J. Ewing Mears, of Philadelphia, in 1884, first proposed the removal of the Gasserian ganglion; and Hartley, of New York, in 1891, first performed this operation by the so-called Hartley-Krause method. During the period of evolution from 1891 to the present, the peripheral operations of the terminal branches of the several divisions have been abandoned, and alcoholic injections have taken their place. During the same period, operations on the Gasserian ganglion have been replaced, with trivial exceptions, by operations on its sensory root.

It is just twenty years since the **Sensory Root Operation,** as proposed by Spiller, was first performed. It has more than fulfilled the claims of its sponsor as being safer than a gasserectomy, yet with all the assurance of permanent relief. In these two decades, modifications of the technique in minor details have been made from time to time, until to-day the operation might be said to be a finished product. Frazier has had only two recurrences in a series of 221 operations. These recurrences should not be charged to the principle underlying the sensory root operation. They were due in these cases to errors in technique, for he found at the secondary operation, performed twelve years later, that in both instances a portion of the root had not been divided at the first operation.

The operation should be reserved for what is called major trigeminal neuralgias, or, if it is preferred, Fothergill's disease. When mistakes in diagnosis are made, it is quite possible, if not probable, that the operation will afford little if any relief. Our mastery of the treatment of major trigeminal neuralgia clears the field for study of those other forms of neuralgia, which, while in the trigeminal zone, do not originate in any lesion of the nervus trigeminus, and are not relieved by any operation on it. Our thoughts are now directed to the sympathetic system. What part the sphenopalatine ganglion may play in the etiology of these atypical forms is a question deserving thoughtful consideration. Accumulating evidence in Frazier's clinic has at least aroused the suspicion that the next advance in the surgery of neuralgias may deal with the resection of the sphenopalatine ganglion. The technique for its removal is now engaging his attention.

*A Surgical Approach to the Sphenopalatine Ganglion* has been devised by Frazier.[3] That there are certain pain phenomena of the face that are not attributable to lesions of the trigeminal nerve, no one will question. That some of these pain syndromes are relieved by cocainization of the sphenopalatine ganglion he has demonstrated on many occasions. The sphenopalatine ganglion derives its sensory supply from the maxillary division of the trigeminal nerve; but the conventional operations upon the trigeminal tract give absolutely no relief to these atypical neuralgias. Since the sphenopalatine ganglion has intimate connection, through the large superficial petrosal nerve, with the sympathetic system, one wonders whether the pain of these neuralgias may be of sympathetic origin. There is nothing very speculative in this supposition, since in other territories there are painful conditions in the origin of which the sympathetic system is an acknowledged factor.

Attempts to relieve these neuralgias by **Alcoholic Injection** of the sphenopalatine ganglion, as proposed by Sluder, meet either with only partial success or with failure. Knowing the minute dimensions of the ganglion and the difficulty of access to it, one can readily understand why the results of injection are in many instances unsatisfactory, and bear no analogy whatsoever to alcoholic injections of the divisions of the Gasserian ganglion. Only by the extirpation of the ganglion in a series of appropriate cases shall we be able to speak with any positivity, either as to the etiology or as to the treatment. If there is a clinical entity—call it Meckel's neuralgia if you will—the extirpation of Meckel's ganglion should be curative in effect, should it not?

Upon this assumption, therefore, Frazier and Grant have been at work in an attempt to find a way of approach to the ganglion which would make it accessible for purposes of extirpation. In the two instances in which the operation was performed, there proved to be no inherent technical difficulties in gaining access to the fossa in which Meckel's ganglion is located.

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## NEURITIS OF THE EXTERNAL CUTANEOUS NERVE. (*See* MERALGIA PARÆSTHETICA.)

## NEW GROWTHS. (*See also* CANCER AND ITS PREVENTION; NÆVI; ETC.)

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

### CANCER.

*Examination of the Blood.*—There are many significant chemical changes in the blood coincident with malignant tumours. Killian and Kast[1] state that, of 119 cases examined, about 80 per cent showed a definite increase in the uric acid concentration of the blood: about 60 per cent an increase of the urea nitrogen and creatinin. This observation appears to indicate renal insufficiency; it was found invariably in general abdominal carcinomatosis; in about 90 per cent of cases of carcinoma of the bladder, prostate, uterus, and rectum; in about 50 per cent of cases of carcinoma of the stomach; and rarely in external tumours. The extent of the renal insufficiency was independent of the age of the patients and the associated anæmia. These writers believe that a pre-operative chemical examination of the blood is of great prognostic value in malignancy, since it serves as an excellent index of renal function, and also of any acidosis.

*Constitutional Nature of Cancer, and Cancer Control.*—Little[2] writes an interesting article under the title "Cancer Control". He states that cancer has never been proved to be a local disease at any stage, nor has cancer ever been proved not to be a constitutional disease at every stage. He proceeds to throw doubt on the use of prophylaxis in the nature of avoiding chronic irritations of the tongue and lip, and so forth. He indicates that care in this respect may prevent the cancer arising in the positions which are particularly cared for, but he proceeds as follows: Consider all chronic irritations as a whole. Who is prepared to prove that white females have more such chronic irritations than either white males, coloured males, or coloured females? Yet white females have cancer oftener than any of the others. Who ventures to say that negro men have fewer chronic irritations than any of the others? Yet negro males have fewer cancers than any of the others. Who cares to state that negresses have more than twice as many chronic irritations as do male negroes? Negresses have more than twice as many cancers as male negroes. Who is willing to assert that single white women have more chronic breast irritations than married white women? They have more breast cancers. Who will demonstrate that Jewesses have fewer uterine irritations than Gentile women? They have fewer uterine cancers. Who will show that uncivilized peoples have only about one-eighth as many chronic irritations as civilized peoples? They have only about one-eighth as many cancers. Do wild animals in their natural surroundings have no chronic irritations at all? Presumably they do have cancer occasionally, though I have not yet been able to find an authenticated instance of it. Cancer among wild animals is at any rate a great rarity.

I am not claiming that chronic irritations are not the usual sites for the appearance of cancers. They are. For the sake of the argument let it be assumed that chronic irritation is a prerequisite for the appearance of any cancer and of every cancer. Then let us assume that we have removed from every individual in this country every chronic irritation that can by any possibility be removed, and that in no instance has any physical damage been done to any individual. This is an absurd assumption, but it is made to show the utmost possible limit to which cancer control by this method could conceivably go. How much would the cancer death-rate be diminished ? No one can say ; but any one may venture an opinion or a guess.

In each individual of cancer age there would remain, after all possible chronic irritation removals, enough chronic irritations unremoved (because unremovable) to furnish sites for a dozen cancers ; each individual would also have from one to a hundred favourable cancer sites to replace the ones removed—scar tissue. Most of these replacement sites would be less favourable sites than the ones removed ; but some of them would be more favourable, because some chronic irritations are very rarely the sites for cancers—corns, for example.

*Spontaneous Regression in Cancer.*—Luden,[3] *inter alia*, draws attention to spontaneous regression of malignancy observed in man. He refers to the publication of 302 cases in which this phenomenon occurred. In about one-third of these cases a microscopic diagnosis was made. In every instance the condition of the patient was inoperable and hopeless. In the absence of treatment the tumours and metastasis disappeared and the patients became clinically well. This is proof positive that the human body, under certain circumstances, can wage a winning fight against malignancy. Luden attributes such cases to a change in the body chemistry.

The main portion of Luden's paper deals with the study of *blood cholesterol*, and he comes to the following conclusions :—

1. Cholesterol is an important chemical constituent of the blood.

2. There is evidence that the blood cholesterol plays an important part by promoting cell proliferation and by combating bacterial invasion.

3. The test for cholesterol in the blood is not a diagnostic test, but it furnishes valuable information concerning the efficiency of cholesterol metabolism.

4. The activation of cholesterol metabolism after radium treatment demonstrated by the blood cholesterol determinations, and the parallel improvement of patients suffering from malignancy, indicate that there is an intimate connection between disturbances of cholesterol metabolism and malignant disease.

5. Cholesterol metabolism can also be improved by dietary measures, suggesting that beneficial effects may be expected from dietary measures tending to reduce the cholesterol intake with the food, combined with radium therapy.

6. Since the life of the cells depends upon their blood-supply, the chemical composition of the blood must be equally important ; radium treatment changes the chemical composition of the blood, as is shown by blood cholesterol determinations.

7. Spontaneous cures have been observed in well-authenticated, inoperable, 'hopeless' cases of cancer ; this proves that the body can wage a winning fight against malignant disease ; as therapeutic measures had proved ineffective in these cases, some internal readjustment must account for the cures. Chemical

investigations will solve the cancer problem by revealing the nature of this internal readjustment.

Bulkley[4] also discusses the constitutional nature of cancer. He thinks it has too long been studied and regarded as a purely local disease. He says that no one would think of regarding arteriosclerosis, arthritis deformans, gout, obesity, or diabetes as local affairs amenable to purely local treatment, nor of expecting to accomplish anything of importance by excising the late lesions of syphilis or tuberculosis. Such views were held by Abernethy and Sir Astley Cooper, and Sir James Paget is quoted as saying: "I believe it to be constitutional in the sense of having its origin and chief support in the blood by which the constitution of the whole body is maintained." J. B. Murphy spoke most pessimistically in regard to the ultimate results of surgical treatment of carcinoma, especially in people who are fat and have lax tissue, that is, who exhibit evidence of imperfect metabolism. William J. Mayo wonders at the frequency of cancer of the stomach, which is absent from the lower animals and uncivilized man. He therefore inquires into the habits of uncivilized man, especially into the cooking or other preparation of his food, which may help to produce the pre-cancerous condition. The mortality from cancer has risen steadily since 1900 by nearly 30 per cent. Bulkley deplores: (1) The glamour of surgery, and latterly of *x* rays and radium, and the craze for immediate and spectacular results; (2) The claims of the surgeons as to the success of operations, and the failure to record and report end-results after the lapse of years; (3) The results of laboratory and research work, wrongly supporting surgeons as to the local nature of carcinosis, and advocating the desirability of the immediate removal of the results or products of it, now called cancer; (4) Ignorance on the part of the general medical profession as to the true facts concerning cancer; (5) The many fake cancer cures which have been foisted on innocent sufferers, together with the many failures of remedies and measures which have been advocated by the regular medical profession.

*Treatment of Inoperable Cancer.*—Norgate[5] mentions some interesting observations in connection with the use of **Pituitrin** in inoperable cancer. He draws attention to four cardinal points present in these cases: (1) Hopeless melancholy; (2) Profound cachexia; (3) Liability to hæmorrhage; (4) Offensive discharges. He finds that the injection of 1 c.c. of pituitrin into the tongue muscle in a case of hæmorrhage from extensive epithelioma, in addition to checking the hæmorrhage, brings about a decrease in the size of the glands. In a case mentioned, the injections were repeated every week for three months, and the patient made rapid improvement, put on flesh, and the cachexia disappeared. Similar results were obtained in cases of malignant growths of the lower jaw, the injections being made into the centre of the growth. The whole growth appears to have gradually shrunk in size, and the patient became bright, cheerful, and hopeful for about twelve months. After the injection the effect on the growth was remarkable, the colour gradually fading away until it was paper white; there was a general shrivelling, which lasted for about twenty minutes. Two injections a week gave no better reaction than one.

Norgate suggests making the injection into the perineal tissues or the buttocks, in bladder, vaginal, and rectal cases. After injection there is sometimes an alarming anæmia, with weakening of the pulse, relieved at once by a little brandy.

Norgate's contribution is an exceedingly valuable one for those who have the misfortune to be responsible for the treatment of inoperable cancerous growths.

## NÆVI.

Fitzwilliams[6] states that nævi are only seen in fat healthy infants, and nearly twice as often in females as in males. The mark is usually present at birth. They occur on the head and neck in 49 per cent of the cases, on the trunk in 29 per cent, and on the limbs in 21 per cent. Generally speaking, they are elongated, and the long axis of the nævus runs in the same direction as the nerve which supplies the part. Some tend to disappear spontaneously; others ulcerate and disappear. In some the growth is enormous, as is seen in those nævi which invade the cheek.

Treatment.—Fitzwilliams deals with the different varieties.

The spider mark, or telangiectasis, looks like a vein with many smaller vessels converging on it. If, however, a piece of glass is pressed over it, the direction of the blood-flow will be seen to be from the so-called vein into the smaller vessels, and never in the opposite direction. The condition is not to be confounded with the dilated vessels which appear on the faces of elderly people. All that is necessary is to destroy the central vessel. A few drops of novocain are injected under the skin, and the vessel is destroyed by a hot needle or the electric cautery. A little ointment is then applied, and a complete cure will result.

The cutaneous nævus should be treated early before it has had time to invade the subcutaneous tissues. If in the skin, it may be destroyed by $CO_2$ snow. The moulded pencil of snow should be cut to the exact size and shape of the nævus, and be pressed firmly down on the latter for a period of thirty to forty seconds. A local frostbite is thus produced. Blebs and superficial ulceration are produced, which should not destroy the true skin. The method is useless if the subcutaneous tissues are involved. The scar following excision of nævi in a young child completely disappears in less than three years.

The actual cautery is of use when dealing with a large nævus partly in the skin and partly in the subcutaneous tissue, in positions where scars are of no consequence. The cautery is heated to a dull-red heat and thrust in near the edge of the tumour. It is thrust deeply and made to destroy the tissue by moving in a semicircular manner under the skin. Two or three insertions are often made, according to the size of the tumour. The dry holes remaining are filled with boric powder, and a dressing is applied; healing takes place under a scab. It is quite unnecessary to touch the red area in the skin itself, i.e., the site of the nævus.

The disadvantage of electrolysis is the length of time and the number of anæsthetics needed. Both poles should be inserted into the nævus. The positive pole is very inactive; the negative pole gives off hydrogen, which is very active in the destroying of tissue, and, furthermore, this needle is surrounded by bubbles and is therefore loose and can be moved freely about in the growth. A weak galvanic current should be used.

*Treatment of Hairy Nævi.*—Du Bois'[7] illustrations before and after show the practically complete cure of an extensive dark-coloured nævus, mostly covered with extremely heavy hairs, the nævus covering the area from the eyebrow nearly to the nostril of a girl of 17. He first destroyed the hairs and the hypertrophied follicles by electrolysis, and then the pigmentation nearly all disappeared under repeated applications of carbon dioxide snow. Local anæsthesia with ethyl chloride or injection of cocaine could not be used, as it modified too much the anatomical arrangement. He was able to reduce the painfulness of the procedures by vigorous preliminary massage with a salve containing equal parts of menthol, phenol, and cocaine, with a little epinephrin. No other treatment—radiotherapy, physical or chemical cauterization—has ever given such good results as in this case, in his experience. The eyebrow is still abnormally heavy, but the young woman wears her hair low on that side to conceal this, as she does not care to allow further electrolysis. The follicles in these hairy nævi are always exceptionally deeply embedded. The skin is also unusually thick, and the nævus is liable to spread and grow darker in colour at puberty. Hence he advises the excision, early, of small hairy nævi.

References.—[1]*Arch. of Internal Med.* 1921, Dec., 813 ; [2]*Med. Record*, 1921, Sept. 3, 407 ; [3]*Canad. Med. Assoc. Jour.* 1922, March, 147 ; [4]*N. Y. Med. Jour.* 1921, July 20, 85 ; [5]*Brit. Jour. Surg.* 1922, April, 495 ; [6]*Practitioner*, 1921, Sept., 153 ; [7]*Rev. méd. de la Suisse rom.* 1921, Dec., 769 (abstr. in *Jour. Amer. Med. Assoc.* 1922, March 4, 690).

## NOSE, FRACTURE OF. (*See* Plastic Surgery.)

## NYSTAGMUS. (*See* Eye Affections, General.)

## ŒSOPHAGUS, DISEASES OF.

*A. J. M. Wright, M.B., F.R.C.S.*

Our knowledge of diseases of the œsophagus in the past has been very fragmentary; but, owing to the introduction of endoscopy and *x* rays considerable advance has been made during the last twenty years. The conditions under which spasm occurs with or without associated lesions of the mucous membrane are still in dispute, but sufficient advance has been made in the differential diagnosis and treatment of œsophageal disease, as a whole, to make it worth while giving a general summary of the progress made. In this article the general symptomatology, pathology, and treatment of œsophageal diseases only are dealt with. Details of endoscopic technique, particularly in dealing with foreign bodies, are better discussed under the general heading of endoscopy.

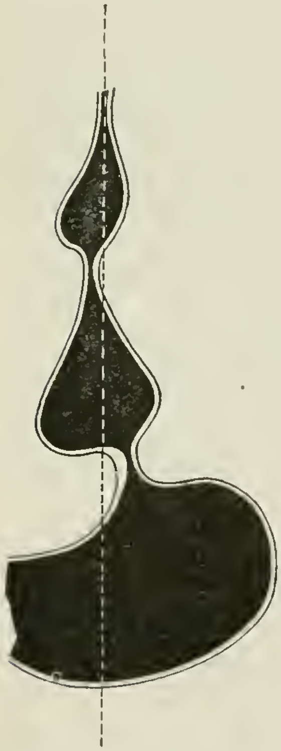

*Fig.* 38.—Pear-shaped œsophagus owing to sacculation above a stricture. (*From* '*La Presse médicale.*')

### FIBROUS STRICTURES.

Etiology and Morbid Anatomy.—These are most frequently due to the swallowing of a corrosive substance, impaction of a foreign body, or other traumatism. Occasionally they result from simple ulceration, tuberculosis, or syphilis. Owing to the domestic use of strong solutions of caustic soda (lye) in some countries for the manufacture of soap, strictures due to the swallowing of a corrosive are relatively more common in those countries. The first stage in this condition consists in a varying degree of œsophageal and peri-œsophageal inflammation or even necrosis. At a later stage healing takes place, with cicatricial contraction. Depending on the causation, the strictures may be single or multiple, annular or cylindrical, the most severe variety being those due to the swallowing of a corrosive. The most common situation for a single stricture is at the broncho-aortic isthmus, but in the case of those due to the action of corrosives the strictures are frequently multiple. An entirely impassable stricture is very rare, and is probably always a secondary effect due to ulceration at the margins of the stricture. In cases of long standing, the œsophagus tends to dilate above the stricture owing to the accumulation of food, with consequent inflammation and atony of the muscular wall. Thus, in the case of multiple strictures, a series of narrowings and dilatations may be present. Owing to the sacculation above the stricture, the œsophagus tends to take the form of a pear with its stem uppermost, and the orifice of the stricture tends to become displaced from the axis of the canal (*Fig.* 38). Cases occur in which, owing to ulceration or sloughing of the œsophageal wall, a fistula is established between the œsophagus and trachea on the one hand, or pleural cavity on the other.

Diagnosis.—Some degree of obstruction to swallowing is always present, and occasionally absolute, even for saliva. Owing to sacculation and retention, regurgitation of food takes place, consisting in some cases of that which has been swallowed some days before. The vomit is alkaline. In cases of any degree of severity, wasting is a constant factor. The immediate coughing up, rather than vomiting, of fluids a few seconds after they are taken, is very suggestive of an œsophago-tracheal fistula. A pleural fistula usually gives rise to the classical signs and symptoms of empyema, but sometimes a localized pleural infection occurs which may point and rupture externally. Ledoux[1] points out that a less severe degree of pleural infection may occur, and relates two cases in which a right pleural effusion followed dilatation of the stricture, but cleared up spontaneously.

*X Rays.*—These cases are best examined with the screen during the swallowing of barium. The opaque fluid is seen to be held up at the stricture, and is only evident below this level as a thin stream. This appearance must not be taken to indicate a stricture of great length, but is simply due to the fact that the fluid can only pass through in a fine trickle. It may be possible to define more precisely the anatomical state of affairs by first examining the patient lying on his back and then turning him over, the barium below the stricture then coating and outlining the whole wall of the œsophagus. The presence of an œsophago-tracheal fistula is shown by the barium outlining the bronchial tree on one or both sides.

Treatment.—In the acute stages, when the injury is recent and the œsophageal wall in a state of acute inflammation, it is probably better to avoid all instrumentation owing to the risk of perforation. Austoni[2] does not agree with this view, and advocates **Intubation** at the earliest possible moment to prevent a stricture forming. It would seem probable, however, that the presence of any tube in an inflamed œsophagus would lead to further injury. In later cases in which the stricture is established, **Dilatation** should be carried out under direct vision through the œsophagoscope. The sacculation above and displacement of the orifice of the stricture tend to render this difficult. The most suitable position for œsophagoscopy is with the patient lying on a plane inclined about 15° from the horizontal. This facilitates the emptying of secretions from the dilated œsophagus. Retrograde dilatation through an opening made in the stomach has been suggested in difficult cases, and for theoretical reasons the common pear-shaped dilatation, with frequently an eccentric opening, would seem to favour this method. However, the fact that one cannot get into the axis of the canal by this route renders it inefficient. The dilated œsophagus above the stricture should be carefully washed out, and an application of cocaine and adrenalin through the œsophagoscope will facilitate discovery of the opening. In a very great majority of cases, if

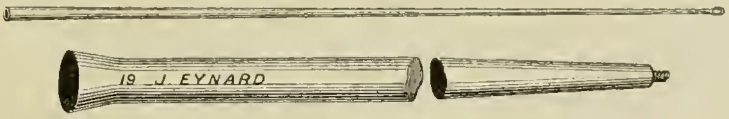

*Fig.* 39.—Guisez's bougie for use in tight stricture of œsophagus.

sufficient patience is exercised, a bougie can eventually be passed under direct vision. Many different patterns of bougie have been advised for this purpose, but in tight strictures a special filiform pattern, as advised by Guisez,[3] is the most useful (*Fig.* 39). When this has been passed, it should, if possible, be left in position for ten or twelve hours, and its presence will cause an appreciable dilatation. A larger dilating bougie can be screwed on to the filiform one as a guide, and the dilatation thus be continued. In all cases treatment has to be prolonged, and it is frequently necessary, when the stricture has been dilated, to pass instruments at intervals for many years.

Another method that is sometimes helpful is that advised by Plummer.[4] Six metres of button-hole twist silk thread, impregnated with beeswax to render it waterproof, are swallowed. The thread is washed down with fluid. To facilitate swallowing, and where the stricture permits, a leaden shot may be fixed to the end, or a portion rolled up in a cachet. At the end of twenty-four hours, the lower end of the thread should be firmly fixed in the intestine. Bougies with a perforated end can then be slid along the thread as a guide. If multiple strictures are present, they should be progressively dilated, one at a time, through the œsophagoscope, commencing with the upper one. In the most extreme cases, in which great emaciation is present, or in which it is found impossible to pass any bougie, **Gastrostomy** should be performed. This, if followed subsequently by washing out the dilated œsophagus, will often render permeable a stricture that was not previously so, owing to the removal of the inflammation in the wall of the œsophagus, and associated spasm. Guisez,[3] whose experience is unique, reports that the majority of severe cicatricial stenoses can be dilated under simple endoscopy even when swallowing is absolutely impossible. In only 8 of his 135 cases was dilatation under endoscopy alone not sufficient. In 6 of these, a temporary gastrostomy allowed the stricture to become passable by diminishing spasm. Sencert states that fibrolysin intramuscularly, in 3-c.c. doses daily, may help.

That an œsophago-tracheal fistula is compatible with life is extraordinary. I have myself observed cases af this condition associated with œsophageal carcinoma in which life was prolonged for some weeks, and Picard[5] relates a case, the result of an old-standing lye stricture, in which the existence of the fistula was confirmed by *x* rays, but in which healing took place after the dilatation of the stricture.

In the rare cases in which dilatation fails, one of the methods of **Œsophagoplasty** remains as an alternative to a permanent gastrostomy. Attempts at forming a new gullet are confined to cases of non-malignant stricture in which the initial lesion need not be removed, and a number of such operations have been successful. The operation is too severe and prolonged to be employed in malignant cases. Gastrostomy is a necessary preliminary. A new œsophagus is formed in the anterior thoracic wall by isolating a length of large or small intestine, and joining its lower end to the stomach. The gut is buried under the skin of the chest wall, and its upper end joined to the upper end of the divided cervical œsophagus by a tube made from a skin flap. The operation must be carried out in several stages. Successful operations are described by Lane,[6] Bohmansson,[7] and Fonio.[8]

## CARCINOMA.

The greater proportion of cases of obstruction of the œsophagus are due to carcinoma. It is convenient to include under this heading also cases of carcinoma of the deep pharynx (retrocricoid carcinoma), as functionally this is part of the œsophagus.

Etiology.—While carcinoma of the œsophagus, as a whole, is relatively much more frequent in men than in women, curiously enough carcinoma in the retrocricoid region, as pointed out by Logan Turner,[9] is much more frequent in women than in men, i.e., 86 per cent of cases, and also frequently occurs in women at a relatively early age, the average age of his cases being 45 years. The etiology of carcinoma here, as elsewhere, is obscure, but there are certain factors which seem to be operative. Thus, not infrequently patients with this condition will give a history of a small swallow for many years, possibly indicating either a congenital narrowing at some point or a condition of spasm. This is particularly the case with retrocricoid carcinoma in women, already referred to, who frequently give a history of long-standing mild dysphagia (*see* Spasm). Septic teeth or the presence of a traction diverticulum are also possible factors, as are the former in carcinoma of the tongue. Bullrich[10] has pointed out that individuals who are in the habit of drinking very hot drinks are more liable than others to œsophageal carcinoma.

Symptoms.—The characteristic symptom of this, as of other œsophageal diseases, is dysphagia. Although the onset of the dysphagia is usually gradual and progressive, being first for solids and later for fluids, the history of a sudden onset is not infrequently met with, due either to the impaction of a fragment of food or to the onset of spasm, which may suggest a functional diagnosis. Other symptoms usually present in greater or less degree are discomfort or pain behind the sternum, flatulence with the regurgitation of undigested and sometimes offensive food particles, and wasting. Janeway[11] points out that rarely dysphagia is absent, wasting then being the only symptom. Cough and loss of voice are frequent, particularly in growths in the upper half of the œsophagus, being sometimes due to involvement of a recurrent laryngeal nerve. Not infrequently two distinct growths are present, with a portion of normal œsophagus between. Growth is often slow, and glandular involvement late. An involvement of the thyroid gland by continuity is not uncommon, and cases of apparent primary malignant disease of the thyroid gland should always be considered from this standpoint, a useless operation on the thyroid gland having been occasionally performed under these circumstances. In retrocricoid carcinoma the cough is often very troublesome, owing to food overflowing into the larynx, and pain running up to the ears is frequent. The laryngoscope in the early stages shows a collection of secretion behind the larynx, while later, swelling of the arytenoids with impaired mobility are present, hoarseness, cough, and salivation being then prominent symptoms. In a large proportion of retrocricoid growths, some change will be seen in the laryngeal mirror at an early stage. The characteristic cough of an œsophago-tracheal fistula has already been mentioned (*see* Fibrous Stricture). Hæmoptysis and a swelling in the neck are occasionally signs. By means of the *x*-ray screen and plates, it is usually possible to map out the site and character of a stricture.

Treatment.—The alternatives are an attempt at cure by removal of the growth, or palliative measures, which include a fluid diet, washing out of the dilated œsophagus above the stricture, intubation or dilatation of the stricture, the use of radium, or a gastrostomy. **Excision** of the growth is rarely possible. Bidgood[12] points out that the difficulties which have to be surmounted are the inaccessibility of the œsophagus, the absence of a submucous layer, with a resulting poor hold for stitches, the inelasticity, the absence of a serous coat, septicity of the lumen, and the liability to infection of the mediastinum. In the case of a growth of the thoracic œsophagus, a successful excision has been performed in a few cases. Lilienthal[13] gives a detailed account of one such case. Access to the growth was obtained through the posterior mediastinum on the left side, the level of the tumour being just above the diaphragm. Portions of ribs were resected, the pleura and lungs pushed forwards, and the œsophagus identified by means of a tube in its interior. A pedicled skin flap was turned in behind the œsophagus, and two weeks later the growth was removed. After several subsequent plastic operations, the patient was able to swallow. The daily passage of a bougie, however, was necessary to keep the newly-formed portion of the œsophagus open. The great risk of this operation is infection of the mediastinum when the œsophagus is opened, and it is therefore essential to perform the operation in two stages, first isolating the portion of the œsophagus invaded without opening it, and, after the surrounding mediastinum is shut off, removing it. Neuhof[14] has carried out experimental resection of a portion of the thoracic œsophagus in dogs. As a result, he concludes that gastrostomy must be a preliminary, that the resection must be carried out in two stages to avoid mediastinal infection, and that, if the gap in the œsophagus be bridged by a rubber tube, the granulation tube formed round this will eventually be epithelialized from either end of the œsophagus. The important factors are the location and length of the lesion. If short and in the neck, an end-to-end anastomosis is occasionally possible. If this is impossible, other procedures are: either to close both ends of the œsophagus and feed through a gastrostomy; feed through an œsophageal fistula in the neck; or reconstruct the œsophagus with skin flaps. Of a total of 98 cases of œsophageal carcinoma published by Turner,[9] removal was attempted in 8, and in all these the growth was in the cervical region. Removal was found to be impossible in one, but in the remaining 7 life was prolonged to from three months to nine years, 2 cases being still alive two years and nine years respectively after operation. In all a fistula was left in the neck. **Dilatation** or **Intubation** of the stricture is sometimes possible, and, if so, is preferable to gastrostomy. This intubation should be carried out under direct inspection through the œsophagoscope, with the same precautions as are used in dealing with a fibrous stricture. Hill's stiletted feeding tube and Symond's funnel are probably the two most useful varieties.

**Radium** gives, as a whole, the best results in the treatment of malignant strictures of the œsophagus. While cures cannot be hoped for, Pinch gives, of 25 cases treated in 1918, 3 improved. Janeway gives, of 22 cases, 1 alive four years later, and 5 others temporarily improved. Forbes gives, of 6 cases treated, some relief in 5. Mills and Kimbrough give, of 11 cases treated, 1 alive eighteen months after. Hanford gives, of 15 cases, 4 apparent cures, in all, dysphagia relieved. Mills[15] points out that the essential elements in such treatment are: (1) A decision as to the location and character of the stricture; this is as a rule most usefully arrived at by the *x* rays. (2) The stricture must be rendered permeable; the swallowing of a silk thread, as described under fibrous stricture, is frequently of great assistance in this. (3) The stricture having been dilated and its length estimated, applications of radium should be made to the whole length of the stricture. One of the most difficult problems is the devising of a means for keeping the radium in position. This object can sometimes be achieved either by checking the position of the radium tube with the *x* rays, or by accurate measurements on the flexible carrier of the radium, or by the placing of an olivary bougie at either end of the growth with the radium container between. The size, duration, and frequency of doses vary considerably. Mills advises from one to seven applications of 50 mgrm., each application lasting six hours; Forbes 25 mgrm., applied for twenty-five hours; and Vinson[16] 50 mgrm., applied from three to sixteen hours, with three or four exposures.

## SPASM.

Some degree of spasm of either the upper or lower end of the œsophagus is associated with the majority of organic lesions. There is a considerable diversity of opinion as to the occurrence or degree of spasm which may be found unassociated with any decided causative organic lesion in the œsophagus. It is an undoubted fact that *spasm at the entrance of the œsophagus* occurs in association with superficial fissures and erosions, and also a spasmodic obstruction is found not infrequently at this site both with the *x* rays and the œsophagoscope in cases of malignant stricture at the lower end of the gullet. A well-defined clinical type in which, at any rate, spasm at the upper end is a large factor, has been described by Brown Kelly and Paterson.[17] The patients are all women of middle age who have suffered for many years from a mild degree of difficulty in swallowing. This difficulty is at first intermittent, but later on becomes constant and progressive. The patient is compelled to restrict the diet to semi-solids, and hard particles frequently stick high up and have to be regurgitated. The individual is usually nervous in regard to eating meals, and prefers to take them alone and to spend a considerable time over them. The patient is usually sallow, rather thin, the tongue is shiny and atrophic with whitish patches, and there are frequently fissures at the angles of the mouth. The pharynx may show similar changes. That this condition is not infrequently followed by retrocricoid carcinoma has already been stated. On examination with the œsophagoscope, the mucous membrane at the entrance of the œsophagus is found to be thinned and easily damaged; but the fact that a normal-sized tube will pass seems to show that spasm is the essential cause of the dysphagia. In these cases dilatation by a finger-stall blown up on a metal catheter is usually effective. Bronner[18] has described fissures in the mucous membrane of the mouth of the œsophagus in this type of case. A transient condition of spasm at the upper end is also met with in young females of a neurotic disposition.

### CARDIOSPASM.

It is in this class of case that the greatest differences of opinion exist. The clinical condition to which this term is here applied is one in which individuals of middle life or later suffer from a dysphagia due to an obstruction to the passage of the food from the lower end of the œsophagus into the stomach, with dilatation of the œsophagus above, but no obviously demonstrable organic stricture, in the early stages at any rate.

SYMPTOMS.—At first they are those of spasm only. There is a transitory difficulty in swallowing, frequently as much for liquids as solids, but this difficulty later becomes permanent and progressive over many years. As dilatation takes place, there is a sensation of food accumulating, with pressure behind the sternum, and at intervals regurgitation of large quantities of accumulated fluid. This vomiting occurs soon after food is taken and may be worse on a fluid diet. The upright position in bed may be necessary to prevent vomiting. These patients are always air-swallowers. The final stages of this condition resemble those of organic stricture with much emaciation. In the early cases, on examination with the œsophagoscope, the tube can be pressed through the cardia. Later, owing to secondary organic stricture, this becomes impossible, and examination shows a dilatation containing several days' food even after twenty-four hours' starvation. The walls of the pouch are grey and sodden, with red inflammatory patches and often leucoplakia. In some cases carcinoma supervenes. On examination with the *x* rays, the opaque meal, after a small portion has entered the stomach, is seen to be held up at the lower end of the œsophagus for as long as from half an hour to two hours. Normal peristaltic movements are present in early cases. The œsophagus above is more or less dilated and sacculated, depending on the duration of the condition, this dilatation showing a rounded lower end, in contradistinction to the irregular funnel-shape of a malignant stricture. The diaphragm may be observed to be lower than normal.

Pathology.—Views as to the exact nature of the condition are diverse. A congenital atony or dilatation of the œsophagus has been suggested; but probably the condition is an acquired defect of the neuromuscular mechanism at the lower outlet of the œsophagus, in which spasm and muscular weakness take part in varying degree. Whether this spasm is of the diaphragm, as suggested by Jackson,[19] or of the œsophageal wall itself, is uncertain. Mosher[20] has produced some evidence that a true organic stricture is present, due to inflammatory changes where the œsophagus passes in close contact with the liver in the 'liver tunnel'. This view gains some support from the lowering of the diaphragm noticed with the *x* rays, and Iglauer,[21] employing pneumoperitoneum in conjunction with *x* rays, has shown that adhesions between diaphragm, liver, and œsophagus exist in some cases at any rate.

Treatment.—In the early cases, the patient must be told to chew well and eat slowly. Later the diet should be restricted to fluids in most cases (although some patients do better on solid diet), and the pouch should be washed out with a solution of bicarbonate of soda night and morning. The cardia should be dilated to a maximum. This may be possible by simple bougieing through an œsophagoscope. A bougie passed blindly usually fails, as the opening is situated eccentrically in the sacculated œsophagus; a closed tube filled with mercury may, however, sometimes succeed. A useful method, advised by Guisez,[22] is first to pass a small bougie, and with this as a guide to pass a larger one along the side of it. The largest which can be passed on any one occasion should be left in for fifteen minutes. As an alternative to the bougie, a **Dilating Bag**, as advised by Mutch,[23] may be passed, then filled up with a known quantity of fluid, drawn up into the cardia, and left for two minutes. Its position can be checked by *x* rays. A swallowed thread (*see* Fibrous Stricture) may assist in first passing the cardia. The injection of **Papaverine** may assist in relaxing spasm, and the swallowing of small doses of **Bismuth** and **Calomel**, dry, diminish septic processes in the dilatation. With patience, probably all cases can eventually be dilated, and major surgical measures, such as œsophagoplasty, are seldom, if ever, justifiable. In the worst cases in which water hunger exists, gastrostomy should be performed as a preliminary.

## DIVERTICULUM OR POUCH.

There are two varieties of this condition: traction on the one hand, and pulsion on the other.

**Traction Diverticula.**—This condition is rather a pathological curiosity than a clinical entity. These diverticula are always in the lower half of the œsophagus, are small in size, and as a rule produce no symptoms, being only discovered at a post-mortem examination. Kragh[24] discusses the two views as to their causation, namely, either that they are a congenital defect, or that they are produced, as their name signifies, by traction on the œsophageal wall from without by the fibrosis of tuberculous lymphatic glands. The evidence he gives in support of the latter view is that in 2 per cent of all post-mortem examinations, adhesions are present between tuberculous glands and the œsophageal wall, and also that in 51 specimens of this condition examined, in nearly every case such an adhesion could be identified. It has been suggested that these diverticula are sometimes a factor in the etiology of carcinoma. In an examination of 40 specimens of carcinoma, 4 showed this association; but the extent of the disease might have rendered this unrecognizable in other cases.

**Pulsion Diverticula.**—These always originate in the mid-line of the posterior wall of the hypopharynx opposite the cricoid. The sac consists of the mucous and submucous coats of the pharynx, and opens into the gullet by a transverse slit-like opening about one inch in length. It is generally regarded as an acquired hernial protrusion between the two portions of the inferior constrictor muscle.

Symptoms.—The condition is frequently mistaken for one of stricture. It is characterized by dysphagia, which is more marked as a rule to solids than to liquids, with the return of undigested food hours or days after it has been taken. This difficulty in swallowing is at first most marked for granular food such as rice, beans, etc. As a rule, true vomiting and pain are absent, but gurgling may be a very prominent feature, sufficiently so to render the individual unwilling to mix with his fellows. Loss of weight is not by any means always a prominent feature. There is usually a swelling to be felt in the lower part of the posterior triangle of the neck on the left side, pressure on which produces gurgling and the escape of fluid from the mouth. A bougie, if passed, always tends to enter the pouch, and is therefore arrested 6 or 7 inches from the upper teeth. A skiagram with opaque meal will show the outline of the pouch.

Treatment.—This consists in, either a daily **Washing out of the Sac,** or an **Operation.** The operation of removal is one of considerable risk, owing to the liability to septic infection of the neck. It consists essentially in the isolation of the sac, and either its amputation, invagination, or a combination of the two. When the sac is small, invagination is probably the better method. When large, this involves a risk of asphyxia from the sac obstructing the glottis. To avoid this risk where the sac is large, it may be partially excised or pleated, and the stump or pleated mass then invaginated, as described by Halsted.[25] Where excision, in whole or in part, is employed, risk of sepsis can be avoided by a two-stage operation, the first stage consisting in the isolation of the sac, and the second in excising it after the surrounding tissues have become shut off. The sac should always be emptied before operation. Van den Wilden,[26] as an alternative to excision, isolates the pouch and fixes it in a vertical position subcutaneously. If necessary, it can then be excised easily at a later date.

## SIMPLE ULCERATION AND OTHER INFLAMMATORY AFFECTIONS.

Simple ulceration may occur in scarlet fever, diphtheria, and small-pox. There is an ill-defined group of cases in which extensive ulceration of the œsophagus occurs, usually at the lower end. Possibly some cases described as post-mortem digestion of the œsophagus come under this class. Vinson[27] has described 6 cases from the Mayo Clinic since 1911 of stricture following œsophageal ulceration during pregnancy, usually the result of pernicious vomiting. The essential factors of these six cases were: the onset of severe and persistent vomiting during the latter months of pregnancy, the occurrence of hæmatemesis with retrosternal pain, and the subsequent onset of dysphagia. In 4 of the cases, dysphagia was sufficiently severe to necessitate gastrostomy. In one case death ensued, and the post-mortem showed inflammation of the lower third of the œsophagus with a retro-œsophageal abscess. The remaining cases were relieved or entirely cured as a result of prolonged dilatation. Pringle, Stewart, and Teacher[28] have described 16 post-mortem specimens of ulceration or digestion of the lower end of the œsophagus. Of these, 10 followed surgical operations, 2 followed accidents, and 6 were in medical diseases, two of which were eclampsia. All the cases were characterized by extreme exhaustion and depression of vitality. The signs and symptoms were coffee-ground vomit, occasionally with bright blood, and in severe cases perforation of the œsophagus into the pleura. Pain behind the sternum or between the shoulders was present. The ulceration or digestion was probably due to the accumulation of gastric juice in the lower third of the œsophagus. All cases were fatal, and microscopic examination showed vital reaction and sometimes attempts at repair in the œsophageal wall. Digestion of the stomach was absent in all cases, which differentiates this condition from post-mortem digestion. They conclude that post-operative hæmatemesis is sometimes due to digestion of the œsophagus. The condition of the œsophagus varies from simple erosion to deep ulceration and perforation. Hæmorrhages are always present in the wall of the œsophagus, and digestion of the stomach is absent. Microscopically, there is severe ulceration accompanied by necrosis and inflammatory reaction.

Watson[29] describes two other cases in which, at a post-mortem examination, in one an acute perforating ulcer into the right pleura was present, and in the second a chronic ulcer in the lower end of the œsophagus, without perforation, but with five months' history of pain and hæmatemesis.

## RETRO-ŒSOPHAGEAL ABSCESS.

Endoscopy has demonstrated the existence of cases of retro-œsophageal abscess analogous to those of retropharyngeal abscess. Guisez[30] relates three cases, age 3 years, 2 years, and 13 months. The symptoms consist of progressive dyspnœa, which may prove fatal; some alteration in the voice, which becomes harsh and choky; with dysphagia, which may be absolute. The onset is gradual, and usually apyrexial. Examination of the chest only reveals rhonchi. The symptoms thus resemble those of a foreign body. *X* rays and endoscopy show a pushing forward of the posterior wall of the œsophagus at the level of the few upper rings of the trachea. The softness of the trachea in an infant facilitates its compression.

Treatment consists of incision and evacuation of the pus through an œsophageal tube. All three cases were cured. It may be possible to feel a swelling behind the larynx with the finger. All examinations should be conducted with the patient flat and with the head inclined downwards to prevent aspiration. The etiology is a suppuration of the prevertebral glands at a lower level than those of the retropharyngeal region. The infection in all three cases was mild, the pus was thick and odourless, and the bacteriological examination yielded a few colonies of staphylococci.

References.—[1]*L'Oto-Rhino-Laryngologie Internationale*, 1922, June, 321: [2]*Arch. Ital. di Chir.* 1920, ii. 435: [3]*Presse méd.* 1920, June 26; [4]*Surg. Gynecol. and Obst.* 1910, x. 519: [5]*Arch. f. klin. Chir* 1921. cxv, 744: [6]*Brit. Med. Jour.* 1911, Jan. 7; [7]*Acta Chir. Scand.* 1920, liii. 91; [8]*Schweiz. med. Woch.* 1921, li, 865: [9]*Jour. of Laryngol.* 1920, 34; [10]*Semana méd.* 1919, xxvii, 15; [11]*Radium Therapy in Cancer*, 1917; [12]*Ann. of Surg.* 1921, Nov., 546; [13]*Ibid.* Sept., 259; [14]*Surg. Gynecol. and Obst.* 1922, June, 767; [15]*Jour. Amer. Med. Assoc.* 1920, June 5, 1570; [16]*Surg. Gynecol. and Obst.* 1920, Sept., 300; [17]*Jour. of Laryngol.* 1919, 285; [18]*Ibid.* 1913, 32; [19]*Laryngoscope*, 1922, Feb., 139; [20]*Ibid.* May, 348; [21]*N.Y. Med. Jour.* 1922, June 21, 745; [22]*Presse méd.* 1921, Aug. 20: [23]*Practitioner*, 1921, Nov., 339; [24]*Instit. Univ. of Copenhagen*, 1921; [25]*Surg. Clin. Chicago.* 1919, iii, 667; [26]*Arch. Franco-Belges de Chir.* 1922. March, 526; [27]*Surg. Gynecol. and Obst.* 1921, Oct., 412; [28]*Jour. Pathol. and Bacteriol.* 1921, xxiv; [29]*Brit. Med. Jour.* 1912, Nov. 2; [30]*Presse méd.* 1922, April 29.

## OPEN-AIR TREATMENT, THE SCIENCE OF.

*Joseph Priestley, B.A., M.D., D.P.H.*

Prof. Leonard Hill is nothing unless he is original and advanced in his views. The subject of ventilation he has made all his own. Scientifically considered, the old ideas must be scrapped, and such theories as the increased $CO_2$, the lessened O, and the presence of the organic vapours, as the old standard explanations of the need for ventilation, relegated to the dim ages of the past. Chemical impurity has nothing to do with stuffiness, and an offensive smell in a room does not prove that it is poisonous. What, then, makes confined air harmful ? The answer is, want of movement, and the danger of pathogenic germs massively infecting, through workers who are 'carriers', other workers who are working in their immediate neighbourhoods under closed conditions of work. The range of infection of these 'carrier' germs may extend to a yard (3 feet) even, through speaking, coughing, and sneezing. The harmful effects of dust and smoke go without saying, the latter acting deleteriously by screening the sunshine, in addition to its mechanically-irritating effects upon the delicate mucous membrane of the lungs and respiratory passages!

Body heat must be got rid of as produced, and this is effected by radiation and convection, the latter being greatly aided by wind and air movements. The body temperature in health must always remain about the same, viz., 98·4° to 98·6° F.—a condition secured through the sensitive mechanism of the heat-production centre of the nervous system. Consumption of food, and muscular work, cause increased body heat, and the sweat glands get to work through the nervous system, so as to reduce this increased heat to normal —every gramme of water evaporated, when one sweats, taking away 600 calories of heat. The lining of the respiratory tract also 'sweats', and large amounts of moisture may, in this way, pass from the body to the breathed-in air, which may be, when breathed in, cold and dry as is the case in Alpine and other mountainous health resorts. In this way the respiratory mucous membrane is well flushed and cleansed, with increased determination of blood and lymph to the part, and consequent improved reaction and healthiness. The danger to health of a dry hot atmosphere can be counteracted by the human species through the sweat glands (if healthy) ; but a moist hot atmosphere is deadly, as neither the sweat glands nor the lining of the lungs can act properly. Proportionately, moist *warm* (as opposed to hot) atmospheres lower health and working efficiency—metabolism being at a low ebb.

Sunlight is health-giving, but how ? It may be that some of the rays penetrate to, and are absorbed by, the blood. Ultra-violet rays are absorbed by the surface of the body, but do not penetrate. In the case of sun baths, pigmentation of the skin is caused and sunburn thereby prevented. Gradual exposure to the sun is necessary. Febrile cases of phthisis must not be exposed to the sun, as by so doing the patients may become sunburnt or overheated.

Prof. Leonard Hill has introduced the Kata thermometer; a sensitive instrument, which records how quickly air is cooling and evaporating moisture from the body, and not only (as the ordinary thermometer does) the average surrounding temperature. The Kata thermometer is a large-bulbed alcohol thermometer of standard size, with stem graduated from 100° to 95° F. It is warmed up in hot water till the meniscus rises above 100° F. The bulb is then dried, and the rate of cooling of the meniscus from 100° to 95° F. taken with a stop-watch. From a factor number determined for each instrument, the cooling power is deduced in millicalories ($\frac{1}{1000}$ grm. calories) per square centimetre (of Kata surface at body temperature) per second. The instrument is used as a dry- or wet-bulb thermometer, the latter requiring a wet muslin glove to be fixed over the bulb.

In factories, schools, etc., the reading of the cooling power by the dry Kata thermometer must not be less than 6 with a temperature of about 60° F., if a maximum output of efficiency is looked for in the workers or scholars.

In still air, the dry Kata thermometer has a cooling power of 10 at 0° C. and about 5 at 20° C.; but, with a wind of nine miles per hour, this cooling power rises to 40 at 0° C. and 20 at about 15° to 16° C.—rising still more as the wind increases in velocity. In this way, it is shown that wind is far more important than temperature to the cooling of the body, and this fact should be remembered in dealing with the important subject of open-air treatment in relation to disease.

## OPTIC ATROPHY AND NEURITIS. (*See* Eye Affections, General.)

## ORIENTAL SORE. (*See* Leishmaniasis, Dermal.)

## ORTHOPÆDIC SURGERY. (*See* Bones and Joints, Surgery of.)

## OSTEOCHONDRITIS DEFORMANS. (*See* Bones and Joints, Surgery of.)

## OTITIS. (*See* Ear.)

## OVARY, FUNCTION OF.

*W. E. Fothergill, M.D.*

*After-results of Removal of the Appendages in Hysterectomy.*—J. W. Bride[1] collected 300 cases in which the uterus was removed for various lesions during the years 1909–13 inclusive at the St. Mary's Hospitals, Manchester. The average age of the patients was 39, and none had ceased to menstruate at the date of operation. In the majority of the cases both appendages had been removed with the uterus. Bride succeeded in tracing 231 of the patients, amongst whom were 45 who retained one or both ovaries. The results of the operation were investigated by analysis of the answers to a set of thirteen questions. The figures are discussed in detail and also expressed in tabular form. His observations may be summarized as follows: (1) Improvement in general health is distinctly more frequent after the radical than after the conservative operation. (2) Irritability of temperament is complained of rather more often after the conservative operation. (3) As to flushings and sweats, the remarkable feature was that 73 per cent of those who retained one or both ovaries had these symptoms. Of those whose appendages were removed, 91 per cent had flushings and sweats. In this respect, therefore, there is not so much difference as might have been expected between the two classes of cases. In theory these symptoms should not occur when an ovary is retained. (4) Nervous symptoms followed the conservative operation in 39 per cent, and the radical in only 34 per cent. (5) The persistence of pain after the operation was much more frequent in the conservative than in the radical cases, and this is one of the strongest pleas in favour of the radical operation. (6) There was said to be disturbance of sexual relations in 39 per cent after the radical and in 25 per cent after the conservative. Bride concludes that there is very little to choose between the two types of operation. The advantage lies with the radical in every way save two. These exceptions are the occurrence of flushes and sexual disability; but even in these matters the difference is but slight. The advantages of the radical operation outweigh these two disadvantages, for it is easier and quicker, and therefore safer for the patient. The result is better, as there is a smoothly peritonized pelvic floor with linear scar and less risk of the formation of adhesions. Again, the risk of subsequent pathological changes in the ovaries is removed.

W. P. Graves[2] writes on the ovarian function, and remarks that the question of ovarian conservation has been regarded as for ever settled, it being a canon that ovarian tissue, even if it be only a minute vestigium, must be religiously preserved. A minority of operators, however, have detected in the over-enthusiastic preservation of ovarian tissue a serious menace to the patient's health. They have suspected that the alleged influence of the ovary on the mature human organism may possibly be exaggerated, and have recognized that a permanent absence of the ovarian function may be less detrimental to the patient than an irritating impairment of function resulting from mutilated organs. Of what value are the ovaries to the human organism ? In answering this it must be realized that glands possess different values at different periods. The thymus, for example, atrophies after the age of puberty. The ovary is no exception to this law. During development it appears to act chiefly as an organ of internal secretion. After the age of puberty it assumes a new rôle, its chief function being devoted to the purposes of reproduction. Outside this its internal secretory function is henceforth in abeyance, and no one has yet defined it or its manifestations ; it may act as a temporary balance check to other more powerful endocrine organs.

What is the difference between the normal woman of reproductive age, and one whose ovaries have been removed by operation, or defunctionated by radium, or atrophied by the normal menopause ? Of permanent changes there are two : (1) cessation of menstruation, and (2) local atrophy of the external genitals. Of temporary changes there are vasomotor disturbances represented by hot flushes. Cessation of menstruation has no specific effect on a woman's general organism. Local atrophy of the external genitals is no more marked after artificial than after normal menopause, and in either case it is, during the continuance of married life, very rarely sufficient in degree to attract attention. In the unmarried it is of no importance. Popular fallacies regarding changes following the loss of ovaries demand mention. A common one is fear of reversion to the male type—growth of hair, deepening of voice, and the like. These absurd notions can only have arisen by false analogy from the high-pitched voices of eunuchs ! It is quite probable that, after full maturity, ovarian defunctionation causes little if any impairment of sexual sensibility if such has previously been normally established. There is no foundation in experience for the fear of the acquisition of abnormal fat if the removal of the ovaries is performed after full maturity.

After a study extending over many years, Graves is convinced that, after maturity, the chief province of the ovary is reproduction ; and that as an organ of internal secretion it is otherwise comparatively unimportant to the general human organism. This view is confirmed by the results of ovarian therapy. Even at its best the action of ovarian extract is uncertain and, except in occasional brilliant instances, rather futile. Outside its specific relationship to the reproductive functions, the influence of ovarian substance on the rest of the body is slight. Graves accordingly, when dealing with mature women, does not believe in leaving the ovaries *in situ* in operations where a removal of the uterus is necessary. Experience has convinced him that retained ovaries, though possibly diminishing to some extent the vasomotor disturbances of the artificial menopause, are of no permanent benefit, but on the other hand may be the source of later serious complications. He also does not believe in those operations that seek to preserve minute portions of ovaries and endometrium so as to maintain some semblance of the menstrual function. They often lead to a long-drawn-out and distressing menopause, and may be associated with serious psychoneurotic states. If menstruation is to be preserved, enough tissue should be left to maintain full menstrual activity. (*See also* MEDICAL ANNUAL, 1919, p. 340, for abstract of Polak's papers; and MEDICAL ANNUAL, 1917, p. 389, for papers on ovarian grafting, by Chalfant, Martin, and Tuffier.)

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## PANCREAS, SURGERY OF.

*E. Wyllys Andrews, M.D., F.A.C.S.*

**Acute Pancreatitis.**—In view of the enormous amount of experimental work done recently on this condition, and of its increasing clinical importance, I believe that a review of the present status of the problem is in order.

By acute pancreatitis is meant the fulminating inflammation of that organ often ending in gangrene. Along with this syndrome go the phenomena of disseminated fat necrosis in the abdomen, and the sudden shock and collapse. These whitish-grey patches have been shown to be due to actual saponification of fats by pancreatic enzymes. The mode of onset cannot be definitely stated, but three theories are under discussion. Before considering these, let us review certain actual facts about the behaviour of the pancreas.

1. Simple incision of the pancreas brings no reaction. Leakage of pancreatic fluid is innocuous unless it is activated.
2. Intraperitoneal section of the pancreatic duct, with leakage into the closed belly, causes no reaction, for the same reason.
3. Simultaneous leakage of bile and pancreatic fluid causes typical fat necrosis. Bile can act as a kinase.
4. The same is true of bowel contents.
5. Ligature of the duct causes no reaction, only gradual atrophy.
6. Cutting or ligaturing the pancreatic duct, accompanied by trauma to the pancreas, causes a pancreatitis. Injured tissue contains a kinase.
7. Injection of bowel contents, weak hydrochloric acid, bile, or any one of a number of irritants, will reproduce the typical clinical picture of acute pancreatitis.
8. Liver bile is much more virulent than gall-bladder bile; this in spite of its lesser concentration. Mucus is the protective agent in gall-bladder bile.
9. The normal stimulation of the sphincter of Oddi to contract and thus raise pressure in the biliary-pancreatic tract is acid gastric juice acting on the duodenal mucosa.
10. The opposite, relaxation of the sphincter and contraction of the gall-bladder, has never been demonstrated, although it has been assumed by some by analogy on the law of contrary innervation.
11. Series of dissections have shown that only in a minority of human beings could bile be side-tracked into the pancreas. The anatomical arrangement will often not permit it.

With these facts as a basis, let us proceed to examine the three theories:—

1. Deaver[1], [2] believes that acute pancreatitis is a direct extension from infection in the gall-bladder. He argues that the earliest involvement is always in the upper portion of the head, to which the lymphatics of the gall-bladder run directly. Any theory involving regurgitation of bile into the pancreas must be thrown out, because this is not anatomically possible, and the disease has occurred in cases where the pancreatic duct emptied directly into the duodenum (Douglas[3]).

2. Archibald's[4] explanation is that of bile damage. In an important experiment reported here last year, he produced pancreatitis in an animal by normal

stimulation of the muscle of Oddi. By normal stimulation is meant HCl on the duodenal mucosa. Thus the bile is forced into the pancreas. He believes that bacterial invasion is purely secondary.

3. The third theory is that of reflux of duodenal contents. It has been suggested that paralysis of Oddi's muscle from the passage of a large gall-stone, combined with increased intraduodenal pressure, could cause pancreatitis. Until recently this remained a theory, but lately duodenal reflux and pancreatitis has actually been produced experimentally with the sphincter intact, by obstruction of the bowel. This theory has the advantage of being possible in all anatomical types.

Thus, while Deaver's theory has the weight of clinical evidence on its side, it has never been reproduced experimentally. The other two are capable of very exact experimental reproduction under conditions comparable with the actual disease in man. The question therefore remains an open one.

Treatment.—The therapy must of course be dependent on our conceptions of the etiology. In acute cases intervention is urgent. Drainage of the gall tracts affords the easiest relief, and in early cases is probably sufficient (Deaver). If the gall-bladder is available, cholecystostomy is indicated. Care must be taken to assure oneself that the cystic duct is patent. If occluded, the common duct should be drained. One must bear in mind that it is retrograde drainage that we are seeking. Therefore, if a single tube is inserted into the choledochus, it should point down and not upward.

Most cases will be found to have gone on to a stage where more radical measures are needed. Tension in a swollen pancreas should be relieved if it is extreme, in order to prevent gangrene if possible. Incision of the capsule will accomplish this. Access is best gained through the gastrocolic omentum. If actual destruction of tissue has occurred, actual drainage of the pancreas is indicated. Blunt incision of pancreatic tissue seems dangerous and mutilating, but has proved to be a life-saving measure (Deaver).

**Chronic Pancreatitis.**—In the chronic type, our ideas of treatment have undergone considerable modification. Hitherto it has been an axiom to leave the gall-bladder if the pancreas was under suspicion. It was a safety-valve and a means of easy drainage should acute pancreatitis occur. However, the logical corollary to Deaver's idea of the etiology is that the gall-bladder should be removed, as it is the focus. This has been carried out in a number of our best clinics, and the results seem to have been favourable.

Lund[5], [6] suggests cholecystgastrostomy as satisfying the demands of both schools. Permanent drainage of the gall-bladder is provided to allow its infection to heal. It is also a measure that affords a sure safeguard against any undue rise of pressure in the biliary tract.

References.—[1]*Jour. Amer. Med. Assoc.* 1921, July 16; [2]*Surg. Clin. N. Amer.* 1921, i; [3]*Amer. Jour. Med. Sci.* 1921, Nov.; [4]*Ann. of Surg.* 1921, Oct.; [5]*Surg. Gynecol. and Obst.* 1922, June, 820; [6]*Boston Med. and Surg. Jour.* 1921, Dec. 29.

## PARALYSIS, INFANTILE. (*See* Poliomyelitis, Acute.)

## PARAPLEGIA.

*J. Ramsay Hunt, M.D.*

The general care of paraplegic patients is often allowed to be determined and carried out by the nurse without the supervision that its importance demands. The physician is apt to focus his attention too exclusively on the treatment of the pathological process underlying the lesion of the spinal cord or cauda equina, and to forget that the life of his patient largely depends upon the prevention of septic complications. A discussion on the treatment of paraplegic patients by G. Riddoch[1] may therefore serve some useful purpose, even if it

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only revives, and brings into proper perspective, knowledge much of which is already common property.

*The Paralysed Bladder and Rectum.*—With the onset of severe paraplegia, urine and fæces are retained from atonic paralysis of the detrusor muscle of the bladder and large bowel, and tonic contraction of the vesical and anal sphincters. The period of retention lasts, as a rule, in the case of spinal lesions, for two to three weeks; but where the lesion involves the sacral nerve-roots it may persist for over a year. Under favourable conditions, however, retention is sooner or later followed by periodic micturition and defæcation, each evacuation being the result of active contraction of the detrusor with simultaneous relaxation of the sphincter. Even when periodic micturition has begun, the danger is still great so long as each motor act is ineffective in emptying the bladder completely. Residual urine rapidly decomposes, and therefore must be withdrawn by catheterization, an operation which is never quite free from the risk of introduction of pyogenic organisms.

The following requirements are essential: Evacuation of all the urine in the bladder at least every six hours, by a method which, as far as possible, minimizes the risk of external infection. It is often claimed that urine will remain sterile if instruments are not introduced into the bladder. Those who hold this view advocate that evacuation should be brought about either by allowing the urine to force open the sphincter and overflow from the distended bladder, or by manual expression through the lower abdominal wall at regular intervals. Clinical experience, however, agrees with experimental evidence that such methods court disaster and should not be employed. Paralysed bladders, even in the absence of catheterization, are always infected with pyogenic organisms, which probably travel in the blood and lymphatic streams from the intestines and elsewhere.

Distention of the bladder must also be avoided. The rapidity with which pyelitis and pyelonephritis often develop after prolonged distention of a paralysed bladder, and the results of experimental investigation, show that back-pressure of urine along the ureters has a deleterious effect on the kidneys, and may be quickly followed by the onset of septic nephritis. Stretching of the bladder wall appears to lower its resistance to organismal invasion, and vesical distention delays the onset of automatic micturition, and, if prolonged so that the detrusor muscle is seriously injured, may permanently prevent its appearance in cases of severe paraplegia. Either of two methods can be employed with comparative safety, provided that strict precautions are taken against contamination of urine in the bladder. **Continuous Drainage** by a tied-in catheter, when Kidd's technique is followed, is probably the best method. The second method—that of periodic catheterization—has the disadvantage as compared with the tied-in catheter in that, because the inserting of the instrument into the bladder is carried out more frequently, the risk of infection from external sources is increased. To ensure against stretching of the bladder wall, the urine should be drawn off at regular intervals of not longer than six hours.

In addition to effective drainage of the bladder, **Irrigation** should be carried out night and morning. The chief purpose of lavage is to remove any sediment that may have collected in the bladder, and although it is preferable to use fluids with antiseptic properties, they must be non-irritating. It is safe to employ **Oxycyanide of Mercury** 1–4000, **Potassium Permanganate** 1–4000, or a half-saturated solution of **Boric Acid**; the boric acid solution heated to about 105° is particularly useful when the urine is alkaline, as it dissolves the phosphatic débris which under such circumstances is often deposited on the mucosa.

When the bladder is paralysed, the urine, in the majority of cases, has a tendency to become alkaline, and the alkaline form of cystitis is usually more difficult to control than the acid variety. Thus it is a good general rule to keep the urine definitely but not too strongly acid by the administration of drugs by the mouth. The most convenient preparations for this purpose are **Acid Sodium Phosphate** 30 to 60 gr., and **Ammonium Benzoate** 15 to 30 gr., given in solution three or four times a day. Urotropine as a urinary antiseptic is, in his opinion, an over-estimated drug.

As soon as automatic micturition is established, and has reached the stage at which complete evacuation of all contained urine occurs, artificial drainage can be stopped.

If, in severe and chronic cystitis, lavage through a catheter is unsuccessful in cleansing the bladder, it may be beneficial to perform **Suprapubic Cystotomy** so that through-and-through irrigation can be carried out. Encourage the patient to drink large quantities of water to flush out his urinary passages, and, if gastro-intestinal symptoms are troublesome, exclude milk from his dietary. Vaccine therapy is, on the whole, disappointing in cystitis.

In the management of the paralysed bowel, as in the case of the bladder, care must be taken to prevent distention and ensure regular and complete evacuation of fæces.

*The Prevention and Treatment of Bed-sores.*—One of the most grave complications which may follow gross lesions of the spinal cord and cauda equina is the formation of bed-sores and the toxæmia which results from them. Several factors probably play a part in diminishing the vitality of the skin, and of these not the least important in the early stage of acute paraplegia is defective circulation in the paralysed portion of the body. Bed-sores are always more liable to develop in the presence of debilitating and febrile complications and when the skin is analgesic, for then abrasions and wounds fail to attract the patient's attention. In order that pressure on the paralysed parts be distributed equally, the patient must be nursed on a water or air bed. Further, his position in bed must be altered several times a day, care being taken when he is placed on his side that one lower limb does not rest on the other. An overhanging rope or chain slung from a vertical support attached to the top of the bed is a necessary part of the nursing equipment. By pulling on it and raising himself in this way the patient can help the nurse to move his body, and in addition the exercise entailed is beneficial.

Sufficient time is not always expended in washing the skin, which should be well lathered with soap and water morning and evening. But removal of the dirt is not in itself sufficient. An indispensable part of the process is firm and prolonged friction with the palm of the hand to increase the vascularity of the skin. In giving instructions to the nurse this point ought to be insisted upon, and she should be told to pay particular attention to bony prominences. The whole operation is completed by dusting the skin with a bland powder. Another factor in the prevention of bed-sores is to see that the sheets are kept dry. For superficial clean sores stimulating dressings ought to be chosen, and dry gauze or gauze soaked in **Liq. Aluminii Acetatis** 2 per cent, **Red Lotion,** or a 2 per cent aqueous solution of **Silver Nitrate** will meet this purpose. Bleeding from the surface of the wound, however, is an indication for the use of emollients such as equal parts of **Castor Oil** and **Zinc Ointment** or **Glycerin** and **Compound Tincture of Benzoin.** In the case of deep sloughing sores, the dead tissues must be removed and the wounds thoroughly explored for hidden collections of pus. Excellent cleansing solutions for these wounds are **Eusol** 1–4000, **Liq. Sodæ Chlorinatæ** (B.P.), and **Liq. Aluminii Acetatis** 2 per cent.

*General Hygienic Treatment.*—The success of these local measures depends primarily on the general vitality of the individual. Mentally and physically they thrive best in the open air, and whenever possible they should spend most or the whole of their time out of doors. Again, these patients are kept far too long lying flat in bed. As soon as the pathological process in the vertebral column or spinal cord has settled down, they should be propped up in a sitting position for part of the day, and every encouragement given them to exercise the non-paralysed parts of their bodies. Patients who are unable to walk should, in the absence of bed-sores and urinary sepsis, be made to wheel themselves about, first in a ward chair and later in a mechanical self-propelling chair. Some patients with severe lesions of the cord are in this way able to travel more than twenty miles in a day. A self-propelling chair, to be suitable for this purpose, must be light in weight, fitted with pneumatic tyres, a brake, and a three-speed gear.

Lastly, the mental as well as the physical needs of the patient demand attention. Inability to cope with the situation inevitably results in depression and a desire to be free from the burden of living. Such a patient is in danger of becoming paralysed mentally as well as physically. Some form of work is essential, and it should have a definite aim in view if it is to be successful in holding the patient's interest and preventing morbid introspection.

REFERENCE.—[1]*Brit. Med. Jour.* 1921, ii, 834.

## PARAPSORIASIS.

*E. Graham Little, M.D., F.R.C.P.*

E. D. Chipman[1] records three new cases of this rare condition, illustrating all the types of lesion. In the first case, a girl of 20, the lesions were nummular, suggesting a permanent pityriasis rosea, and lichenoid. In the second, in a man of 35, there were large patches (*P. en plaques*). In the third case, a woman of 26, the lesions began as pink papules, forming later a small scale (*P. en gouttes*), and spreading all over the body. All three cases were cleared up by **Ultra-Violet Light.**

REFERENCE.—[1]*Arch. of Dermatol. and Syph.* 1921, Dec., 807.

## PARATYPHOID FEVER. (*See also* TYPHOID FEVER.)

*J. D. Rolleston, M.D.*

SYMPTOMS.—P. Menetrier, Isch-Wall, and J. Sormont[1] report a case of paratyphoid A infection in a man, age 58, due to consumption of tainted meat. The attack commenced with symptoms of acute cholecystitis, this localization being probably due to the existence of a latent cholelithiasis. The case is of special interest in view of the fact that the organism most frequently found in cases of toxi-infection of alimentary origin is *B. paratyphosus B*, which is more closely allied to the group of bacilli causing meat intoxication, whereas *B. paratyphosus A* is more nearly related to *B. typhosus.*

G. Pinesohn[2] reports a case of pneumoparatyphoid in a man who, after a short prodromal stage characterized by symptoms of enteritis, developed pleuropneumonia. After a short remission the temperature rose again and the sputum became hæmorrhagic. The intestinal symptoms soon completely disappeared, but the pleuropneumonia ran a chronic course. The source of infection was undoubtedly the consumption of tainted meat, the patient being a slaughterer by occupation. While a non-typical paratyphoid bacillus was isolated from the stools, the sputum showed at first *B. paratyphosus A*, and in later cultures *B. paratyphosus B.* An organism could not be isolated from the blood. Unlike Minet's cases (*see* MEDICAL ANNUAL, 1921, p. 358), in which paratyphoid bacilli disappeared from the sputum as improvement set in, in Pinesohn's case the bacilli could be cultivated from the sputum well on into convalescence.

F. T. Foard and T. F. Walker[3] report an outbreak of 44 cases of paratyphoid B caused by the consumption of 'head cheese' (a delicacy consisting of the head or feet of swine cooked, chopped, and pressed into cheese) which had been purchased from a single meat market. The disease was at first mistaken for influenza, owing to the sudden onset with headache, chilliness, joint pains, and pyrexia. The temperature kept high for ten days, and fell by lysis, reaching normal on the seventeenth day. The spleen was not palpable in any case. An eruption resembling rose spots, which was present in 40 cases, appeared between the fifth and seventh day, and affected all parts except the palms and soles. Out of 20 cases examined by Widal's test, 19 gave a positive reaction with *B. paratyphosus B*, and in 15 per cent the same bacillus was found in the fæces.

O. Voigt[4] reports three cases of paratyphoid B in the newborn. The first case, which was fatal, was one of paratyphoid B septicæmia characterized by meningitis, pleurisy, and purulent pericarditis. In the other two cases, which recovered, the disease assumed the form of acute gastro-enteritis, such as is found more frequently in older children. In the first case the mother was healthy, so that the origin of the infant's disease was obscure, while the mothers of the other two infants were suffering from paratyphoid B.

G. Blechmann[5] reports two cases of paratyphoid B in infants 9 and 21 months old respectively. In both cases intense diarrhœa was the principal symptom from the first. Meningeal symptoms then developed, though the cerebrospinal fluid was clear in both cases. The temperature charts resembled those of the disease occurring in the adult. Both infants recovered.

O. Bossert[6] records seven cases of severe paratyphoid fever in children associated with characteristic symptoms of tetany. Mechanical and electrical excitability was well marked, but no attacks of laryngospasm were observed. Bossert suggests that the attacks of carpopedal spasm and mechanical excitability following febrile diarrhœa in infants, as described by writers in the pre-bacteriological era, were really due to paratyphoid infection.

H. Vincent[7] records a striking case of *osteoperiostitis* of the lumbar column, sacrum, and ilium which occurred three weeks after an attack of enteric fever, in a girl of 18, whose blood agglutinated *B. paratyphosus B*. Rapid recovery followed four subcutaneous injections of T.A.B. vaccine, the doses consisting of $\frac{2}{3}$ c.c., $\frac{3}{4}$ c.c., 1 c.c., and 1 c.c. respectively. The quantity of paratyphoid B bacilli injected was about 2500 million.

A. Langwill[8] reports a unique case of *suppurative arthritis* of the shoulder-joint in an infant, age 11 months, due to *B. paratyphosus C*, a pure culture of which was obtained from the joint. Recovery took place after incision and drainage. There was no history to indicate enteric fever, and Langwill suggests that the infection was due to a change from exclusive breast feeding to partially artificial feeding.

REFERENCES.—[1]*Bull. Soc. méd. Hôp. de Paris*, 1922, 559 ; [2]*Deut. Arch. f. klin. Med.* 1922, 25 ; [3]*Public Health Rep.* 1921, 2095 ; [4]*Monats. f. Kinderh.* 1922, 237 ; [5]*Le Nourrisson*, 1922, 38 ; [6]*Deut. med. Woch.* 1921, 558 ; [7]*Bull. de l'Acad. de Méd.* 1922, i, 517 ; [8]*Lancet*, 1921, ii, 1158.

## PATELLA, DISLOCATION OF. (*See* BONES AND JOINTS, SURGERY OF.)

## PEDICULOSIS CAPITIS.

*E. Graham Little, M.D., F.R.C.P.*

Peters[1] recommends the following formula :—

R Sod. Taurochol. 10 grm. Aq. ad 1000 c.c.
Ol. Eucalypti 50 c.c.

Dissolve the bile salt completely in water, add the eucalyptus oil, and shake well.

This lotion is well rubbed into the head until all the hair is wetted. The head is then wrapped in a bathing-cap or towel, and the application left on all night. The head is washed with soap and water next morning, and a fine-toothed comb used daily for a fortnight, notes being kept of any lice found. In 23 per cent of the cases no lice were found after one application. In the remainder a few recently hatched very small forms were discovered, in no case before four days after the first application, in most cases not until after a week, and in a few not until the tenth day. A second application on this reappearance sterilized 63 per cent, while 14 per cent required a third application. This preparation is not toxic, is not irritating to the skin, is not inflammable, and is elegant to use, as it is easily washed out of the hair. The cost of the ingredients works out at 6½d. a pint.

Lenz[2] describes a method for treating large numbers of patients in the shortest time. The apparatus comprises two parts: a rectangular box 50 cm. long, 50 cm. broad, and 75 cm high, and a rubber mask to fix to the patient's head so as to enclose all the hair. The rubber is fixed to the forehead, the ears, and the back of the scalp at the junction of hair and neck. The amount of gas introduced into the box is carefully measured; a 4 to 5 per cent volume of **Sulphur Dioxide Gas** acting for twelve to fifteen minutes was found sufficient to kill pediculi and nits, as was established by experiments to resuscitate pediculi and eggs after this treatment. Sulphur dioxide gas was chosen as being very lethal to the parasite, cheap, and without risk of inflammability.

Auden,[3] as the result of some careful experiments with both nits and adult lice, recommends the use of '**Derbac**' **Soap**, a proprietary article. The head should be well lathered with this for about ten minutes, and then combed out. Lice are stupefied by it, but seem to recover from one application after some hours, and probably both lice and nits require more than one application.

REFERENCES.—[1]*Brit. Med. Jour.* 1922, i, 204; [2]*Münch. med. Woch.* 1921, Sept. 30, 1352; [3]*Lancet,* 1921, ii, 370.

## PEMPHIGUS.

*E. Graham Little, M.D., F.R.C.P.*

Lane and Lambert[1] describe a case of Brocq's syndrome, 'subacute malignant pemphigus'. This type usually begins on the mucosæ, and has the aspect of a severe infection, without temperature, but with marked prostration of the patient. The skin lesions, beginning with bullæ, rapidly develop moist bleeding surfaces which show no tendency to heal, and extend peripherally like a grave impetigo. The prognosis is very bad. The case here recorded was in a woman, age 69, who showed a rapidly extending bullous eruption, and she died within two months of admission. An unusual feature was that the mucosa became involved considerably later than the skin. Blood examined twice proved sterile. Differential counts showed no marked abnormality, and in particular no eosinophilia. The pharynx, bronchi, larynx, and trachea all exhibited an acute inflammatory reaction strongly suggesting a bacterial infection, and Gram-positive cocci were found in the mucosa.

REFERENCE.—[1]*Arch. of Dermatol. and Syph.* 1921, Aug., 141.

## PERICARDITIS.

*Drs. Lian and Pollet.*

*(Translated by Carey F. Coombs, M.D., F.R.C.P.)*

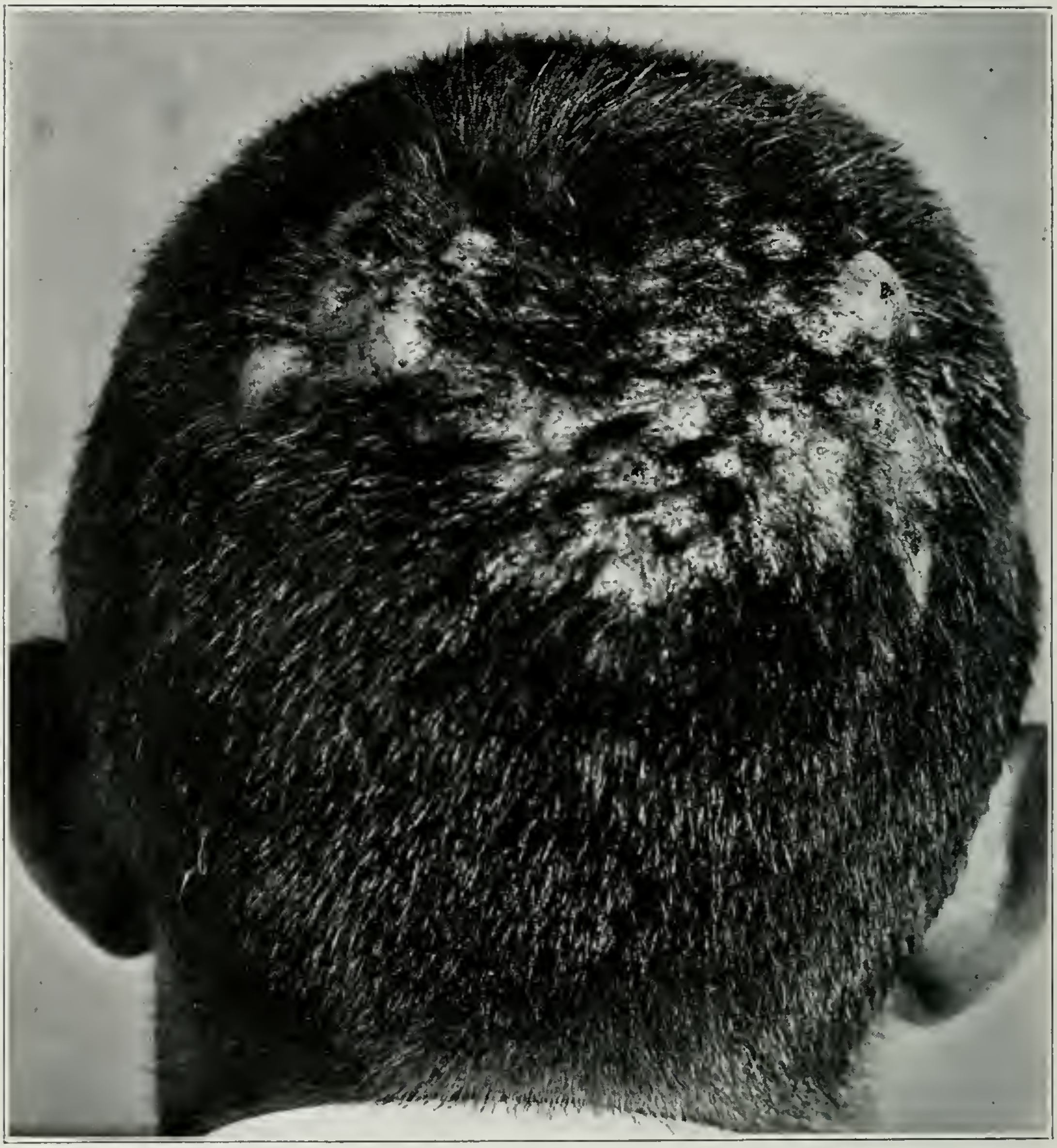
DIAGNOSIS.—*Pericarditis with Effusion.*—C. S. Williamson's[1] experimental and clinical observations lead one to think that the depression of the lower edge of the left lobe of the liver is one of the earliest and most valuable symptoms of pericarditis with effusion.

It has been noticed in several cases where it has been of great help in diagnosis, for it has been observed where another early sign, the disappearance of the cardiohepatic angle, has been wanting.

# *PLATE XXX.*

## PERIFOLLICULITIS CAPITIS ABSCEDENS ET SUFFODIENS

(Wise and Parkhurst)



Numerous isolated and confluent, serous and seropurulent, hemispheric lesions with crust formation due to a serosanguineous exudate.

*By kind permission of the*
*'Archives of Dermatology and Syphilology*

In order to appreciate fully the depression of the lower edge of the left lobe of the liver, it is important that the patient should be examined in the dry stage of pericarditis, and the precise level of the lower edge of the liver noted ; it must be remembered that the left lobe alone may be increased in size and tender in the cardiac liver, the right side not projecting below the costal border at the nipple line, as pointed out by Merklen, and also observed several times by us.

These precautions having been taken, changes in position of the lower edge of the left lobe of the liver may be of definite assistance in the diagnosis of pericarditis with effusion. Thus we have recently seen a case in which the lower edge of the liver was found to rise after each tapping of the pericardium, whereas it was afterwards lowered until a new thoracocentesis became necessary.

*Acute Pericarditis Mistaken for Appendicitis.*—Pain which accompanies acute pericarditis usually attacks the precordial region and occasionally the epigastrium, with or without radiation to the arm. M. H. Fussell and James Kay[2] have just shown, by some illuminating observations, that acute pericarditis accompanied by a tender abdominal syndrome simulates and is often mistaken for appendicitis. There is in such cases acute abdominal pain, accompanied by fever, vomiting, distention of the abdomen, and a rigid and motionless abdominal wall. These abdominal symptoms were generalized, but in some cases seen they predominated in the region of the appendix. Thus in several cases the diagnosis of appendicitis was made. But two or three days after the onset of this appendicular syndrome there was found to be pericardial friction, which became more definite, while the abdominal pain lessened and then disappeared. In one case, where pericarditis was followed by death, the autopsy disclosed the characteristic lesions of a dry pericarditis, with no changes, old or recent, in the appendix.

These new ideas are in accordance with Wynter's sign, that is, absence of abdominal respiratory movements, especially at the level of the epigastrium, in acute pericarditis. The respiratory immobility of the abdominal wall, which is usually unilateral in pleural and pulmonary disease, is bilateral in pericarditis.

All these facts emphasize the importance of examining the precordial region in acute abdominal cases. It is very easy to make a bad mistake in diagnosis and treatment.

REFERENCES.—[1]*Arch. of Internal Med.* 1920, i, 206, and *Jour. Amer. Med. Assoc.* 1921, ii, 2050 ; [2]*Jour. Amer. Med. Assoc.* 1922, i, 40.

## PERIFOLLICULITIS CAPITIS ABSCEDENS ET SUFFODIENS.

*E. Graham Little, M.D., F.R.C.P.*

Under this typically German title Hoffmann described in 1907 a follicular and cicatrizing disease of the scalp, further examples of which would seem to be rare. The disease is characterized by nodules the size of hazel nuts, pale, hairless, and riddled with fistulous openings 4 or 5 cm. deep. Closely aggregated tumours are found, giving a mammillated aspect to the affected areas. When healed, the sites show a superficial atrophy very like Brocq's pseudo-alopecia ; but in the latter disease pustulation is not usually present. Wise and Parkhurst[1] report a new case of this affection, the patient having apparently acquired the disease while on service in France. Some fifty lesions varying in size from a pea to a hazel nut were found on the vertex, oozing pus freely, smears from which showed *Staphylococcus albus* and *aureus*, and streptococcus. Histological sections identified the tumour as a 'pure granuloma' with numerous giant cells, the perivascular infiltration consisting chiefly of plasma cells (*Plate XXX*).

REFERENCE.—[1]*Arch. of Dermatol. and Syph.* 1921, Dec., 750.

**PERITONITIS, GENERAL.** (*See* ABDOMINAL SURGERY, MISCELLANEOUS.)

## PERNICIOUS ANÆMIA.

*Herbert French, M.D., F.R.C.P.*

A vast amount of literature has been published on pernicious anæmia during the last twelve months, but no very striking observations are recorded. An excellent review of the whole condition is printed in the *Guy's Hospital Reports.*[1] Attention should be drawn to the achlorhydria which is apparently the most important factor in the disease. Hurst believes that the Addison's anæmia is caused by a hæmolytic toxin produced by some infection in the alimentary canal, and that this infection cannot occur unless free hydrochloric acid is absent from the gastric contents. Levine and Ladd[2] publish a study of 150 cases. Gastric-juice analyses were performed in 107 of them, and no free hydrochloric acid was found in the gastric contents of 104. Of the remaining 3, one was found post mortem to be certainly pernicious anæmia, the other two were doubtful. Cabot and Carr have published series of cases in which 90 per cent had achlorhydria. This achlorhydria is not a result of the disease. It is not found in the other severe anæmias, and during the remissions of the disease it is still found to be present. It seems probable that it precedes the development of the disease. Valdemar Bie[3] describes an interesting case in a doctor who for sixteen or seventeen years had suffered from dyspeptic symptoms which were found to be due to gastric achylia. Ryle and Bennet have shown that 4 per cent of healthy young men have achylia. Hartman[4] records the case of a patient who, after total gastrectomy, developed all the signs of pernicious anæmia. Moynihan has also recorded a case of his in which severe anæmia developed after gastrectomy, although pernicious anæmia was not suspected nor looked for post mortem. The fact which emerges from these observations is the necessity of a gastric-juice analysis in patients with symptoms of dyspepsia or ill-defined gastric symptoms in early middle life. Where achylia is found, hydrochloric acid should be ordered by mouth, not only to relieve the dyspepsia, but with the knowledge that the possible development of pernicious anæmia in the end of the fourth decade may thus be prevented. This brings us to treatment. From the above it is obvious that dilute **Hydrochloric Acid** should be given with each meal. The pharmacopœial dose is inadequate to provide the amount of acid used in the digestion of a meal. About 1½ to 2 drachms of the dilute hydrochloric acid, diluted in half a tumblerful of water or lemonade, should be given during or immediately after meals. **Arsenic** can conveniently be given with it. Valdemar Bie, in the case mentioned above, relied on the hydrochloric acid combined with **Dieting** and **Iron.** He gave the acid by means of the duodenal tube once daily. The result is excellent, and the patient reports himself well three and a half years after treatment was commenced. Bie considers that it may be regarded as a cure.

As regards **Transfusion,** there is still a great divergence of opinion. The majority appear to regard it as a palliative, the benefit of which is of short duration. [From personal experience in a number of cases the writer considers that its effects are more than palliative only. Three transfusions given at short intervals of a week or ten days have had remarkable results, and the improvement almost to par has been maintained for nearly a year without relapse so far in two patients who were practically moribund when the first transfusions were given. In his opinion, transfusion is too long delayed in the majority of cases. The patient's own blood-making machinery appears to be stimulated by the injection of the donor's blood. In this condition, as in all medical conditions, it is of the greatest importance to test the patient's blood directly with that of the donor, and not to rely on mere grouping.—H. F.]

As regards **Splenectomy,** Hitznot[5] has performed the operation in seven patients, of whom three improved for periods of one to four years, and three died within one year, while in the case of the seventh sufficient time has not elapsed to state the final result.

Logan[6] describes four cases of infection with *Balantidium coli* in whom the typical pernicious anæmia developed. Coincidence, however, does not seem to be excluded, especially as two of the patients continued with the signs and symptoms of pernicious anæmia after they were apparently free from *Balantidia.*

Zinck, Clark, and Evans[7] carried out a series of experiments in which protective power of the human blood serum against hæmolytic agents was investigated in healthy individuals and in those suffering from pernicious anæmia. Normally the blood serum has the power to protect against many different hæmolytic agents, among which are sodium oleate and saponin. These two substances were chosen on account of the fact that the former may readily be supposed to be present in the body under normal conditions, while saponin has never been demonstrated. Their conclusions are that the sera of patients with hæmolytic anæmia, and other conditions in which the liver and spleen are prominently involved in the disease process, show a marked diminution in protective power against hæmolysis by saponin and sodium oleate.

References.—[1]*Guy's Hosp. Rep.* 1922, April, 154 ; [2]*Johns Hop. Hosp. Bull.* 1922, Aug., 254 ; [3]*Lancet,* 1922, i, 631 ; [4]*Amer. Jour. Med. Sci.* 1921, Aug., 211 ; [5]*Ann. of Surg.* 1922, Jan., 31 ; [6]*Amer. Jour. Med. Sci.* 1921, Nov., 668 ; [7]*Johns Hop. Hosp. Bull.* 1922, Jan., 16.

## PERTHES-CALVE-LEGG'S DISEASE. (*See* Bones and Joints, Surgery of.)

## PERTUSSIS. (*See* Whooping-cough.)

## PES CAVUS. (*See* Bones and Joints, Surgery of.)

## PHAGEDÆNA, TROPICAL. (*See* Tropical Ulcer.)

## PHTHISIS. (*See* Tuberculosis, Pulmonary.)

## PILES. (*See* Hæmorrhoids.)

## PLAGUE.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Etiology and Pathology.—J. A. Mitchell[1] gives a brief history of plague in South Africa, and deals more fully with the interesting recent outbreaks in the adjacent parts of the Orange Free State and the Transvaal on isolated farms, which a prolonged investigation eventually traced to infection from an epizootic in the gerbille or 'nachtmuis' (*Gerbillus*), and in the multimammate mouse (*Rattus concha*), which are abundant in sandy stretches of the district. Recent migration and finding dead gerbilles in their burrows led to bacteriological examinations showing plague bacilli in their bodies. They are nocturnal and do not enter houses, but one of the attacked was a man who had his midday meal on land three miles from his house, in which dead and plague-stricken gerbilles were found, and it is now believed that these rodents have been responsible for the plague in this area since 1916 through their fleas. L. G. Haydon[2] gives very similar information on the same outbreak.

W. W. Clemesha[3] discusses plague on board ship, and suggests that chronic types of the disease in ship rats, similar to those which Kundhardt and Chitre have described in villages in India attacked in the off season, would be very difficult to detect. He thinks grain cargo ships are most likely to carry plague from one country to another, and should be disinfected by the Clayton process in order to kill their rats after being unloaded.

*Pneumonic Plague.*—Wu Lien Teh[4] reports on the pneumonic plague outbreak in Manchuria in 1920–21, beginning in the Trans-Baikal district of Siberia and spreading south-eastward to Hailar, where isolation was carried out. Some of the patients, however, were released by an attack of soldiers on the police guard, leading to still further spread of the disease, but control of the passenger railway service limited it, so that only 8500 deaths took place, against 50,000 in the 1910–11 outbreak; 60,000 anti-plague gauze masks were used with great advantage. Infection occurred mostly at night among crowded coolies, while sleeping in the open air, however cold it might be, protected. Many burial coolies died, the infection being traced to the clothes of the dead, from which plague bacilli were cultivated in 16 out of 22 instances. Antiseptics had surprisingly little disinfectant action on plague sputum, which is very resistant. Moist sulphur gas was best for rooms; and for the doctor's clothes and overalls, fumigation with formalin gas made from 100 grm. permanganate of potash, 100 grm. hot water, and 200 grm. of formalin warmed in a pot.

Prophylaxis.—R. W. Mendelson[5] discusses the problem of dealing with plague in Siam under an Asiatic government of an ignorant population, and concludes that the slow method of gradual education is the only feasible policy. The disease tends to increase and decrease in waves of three or four yearly periods, while the maximum seasonal incidence is March, at the end of the cold dry season.

Treatment.—R. W. Hornabrook[6] writes on his experience of plague in India and Africa, and condemns puncturing plague glands, if it can possibly be avoided, for fear of introducing the bacillus into the circulation, converting a bubonic into a septicæmic case.

References.—[1]*S. Afric. Med. Record,* 1921, 475; [2]*Lancet,* 1921, ii, 1103; [3]*Ibid.* 1338; [4]*Ibid.* 853; [5]*Jour. Trop. Med. and Hygiene,* 1922, 13; [6]*Med. Jour. of Australia,* 1922, April, 408.

## PLASTIC SURGERY. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Tube Skin Flap.**—Pickerill and White[1] discuss the use of the tube flap. By this means, tissue can be conveyed to the face from the chest, neck, scalp, or forehead, in a viable condition. A neck tube-flap is fashioned as follows:—

1. Two parallel incisions are made along the line of the sternomastoid about 2 inches apart. The skin, subcutaneous tissue, and platysma are then dissected off the sternomastoid, thus forming a broad flat flap. The two edges of the flap are now brought together, with the skin surface outwards, and sutured accurately, thus forming a 'tube'. The skin margins of the wound are then freely undermined and brought together, leaving the 'tube' hanging free for the greater part of its length, but united to the neck at its upper and lower ends (*Plate XXXI, A*).

Pickerill prefers in this class of tube—i.e., where there is no direct arterial supply or venous return—to leave it for ten days or a fortnight until the margins have well united before swinging it up on to the face. By this procedure the possibility of the introduction of sepsis into the length of the tube is considerably lessened (*Plate XXXI, B*). This of course is a most important point, since any serious sepsis in the substance of the tube, if it extends across its whole diameter, is almost equal to dividing it with a knife as far as the vitality of the free end of the graft is concerned.

2. The lower end of the tube, with or without any additional flat flap, is divided, swung up to the face, and inserted accurately in its prepared bed.

3. At the end of ten days the tube is divided at its distal end and opened

# PLATE XXXI.

## THE TUBE SKIN-FLAP IN PLASTIC SURGERY

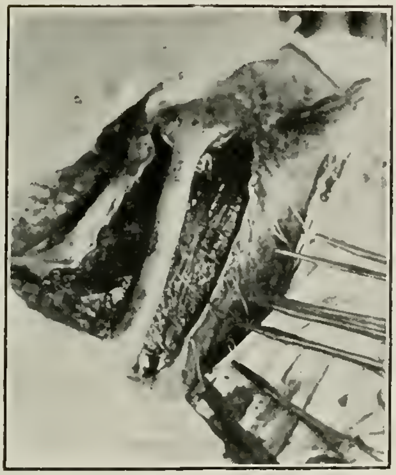


*Fig. A*

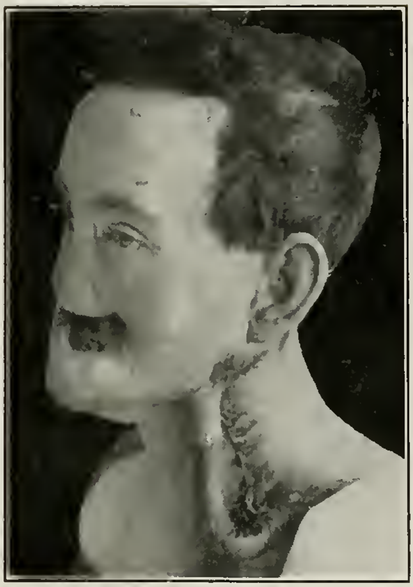


*Fig. B.*

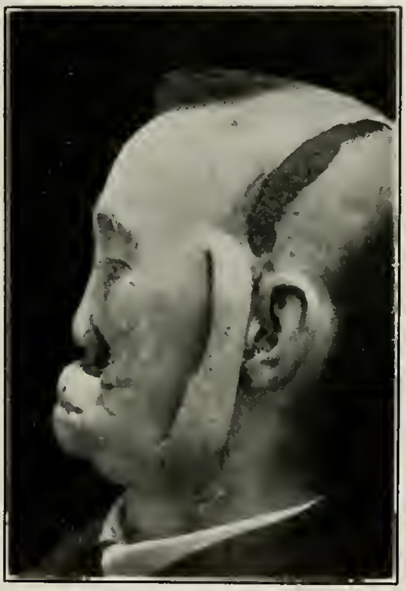


*Fig. C.*

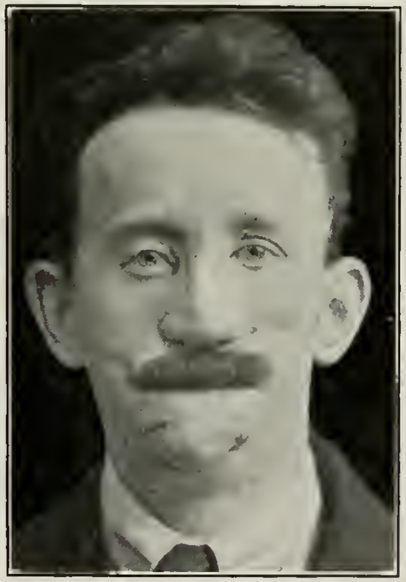


*Fig. D.*

*Fig. A.*—Shows either a tube-flap or tube-graft in process of formation from the neck.

*Fig. B.*—Tube-flap formed from the neck, hanging free except for attachment at both ends. It remains thus for ten days, when its lower end is divided and the graft swung into the desired position.

*Fig. C.*—Double tube-flap formed by the superimposition of a scalp flap upon the neck flap. Preliminary stage for restoration of upper lip.

The neck flap (derived from what is not required for the restoration of the lower lip) serves as an artificial mucous membrane, and the scalp flap as the outer skin of the upper lip, thus enabling the patient to grow a moustache if desired.

*Fig. D.*—Shows complete restoration of upper and lower lips of another patient by means of tube-grafts.

*By kind permission of the 'British Journal of Surgery'*

out flat again. The scar in the neck is excised and the flap reinserted into the neck; thus the only tissue ultimately lost from the neck is from the lower end near or below the clavicle. This area, if large, can always be skin-grafted, and in any case is in a favourable situation.

4. 'Caterpillar' grafts. Should the tube not be long enough for its original intention (indeed it may sometimes with advantage be purposely made short), it may be 'caterpillared' into place. To accomplish this, the lower end of the tube is divided, swung upwards, and inserted into a small prepared bed as high up as possible. At the end of ten days this process is repeated. The lower (original proximal) end being divided, swung up, and in turn inserted in a small prepared bed—and so on until the desired situation is reached.

Small adventitious blood-vessels develop into the ends of such 'caterpillared' tubes with astonishing rapidity. A certain allowance has to be made for shrinkage in length of all tube-grafts; but, given absolute asepsis, this should not amount to more than one-sixth.

The same principle can be applied in the surgery of the limbs, and is strongly recommended by White in the treatment of chronic ulcers.[1]

**Fracture of the Nose.**—Jacques[2] explains that a fracture of the nose is a lateral displacement of the two bones proper of the nose, and this has to be promptly corrected or it heals rapidly in a disfiguring position. The luxation is easily corrected when done early, but by the next or following day the œdema and secretions impede this, and it is necessary to cocainize the interior of the nose and sustain the bones on each side with a stout tampon smeared with petrolatum. This holds the bones in place better than anything applied outside. The tampon is changed at the second or third day, which allows the nose to be modelled more perfectly. Systematic and persevering massage is preferable to any prosthesis or other device to be applied outside. The reduction of the fracture is painful, and far from easy when an interval of from two to seven days has elapsed, and by the end of the second week the outcome is uncertain.

REFERENCES.—[1]*Brit. Jour. Surg.* 1922, Jan., 321; [2]*Paris méd.* 1921, Sept. 3, 199 (abstr. in *Jour. Amer. Med. Assoc.* 1921, Oct. 15, 1289).

## PNEUMONIA IN INFANTS.

*Frederick Langmead, M.D., F.R.C.P.*

Researching into the causes of infantile deaths during the first week after birth, Francis J. Browne[1] has found that pneumonia accounts for the unexpectedly large proportion of 21 out of 80. He concludes that pneumonia is a common cause of death amongst infants at this age, and that it is sometimes due to ante-natal infection from premature rupture of the membranes, so that the infant may not only be infected but be suffering from an advanced stage of pneumonia before its birth. There appears to be little defensive reaction in the infant as compared with the adult. Pneumonia at this period is extremely insidious, generally presenting no characteristic symptoms to announce its presence; even post mortem it may be missed if microscopical examination is not carried out. He recognizes a clinical and pathological entity which he names 'acute hæmorrhagic pneumonia of infants', and which gives rise to sudden death in children, either full time or premature, who apparently have previously been healthy. It follows acute congestion of the lungs, the fragile vessels in the alveolar walls rupturing and flooding the alveoli and bronchi with blood. The sudden death is preceded by epistaxis and blanching of the skin. The etiological factor may be organismal, or possibly of the nature of an immediate anaphylactic reaction. The moral drawn is the importance of avoiding premature rupture of the membranes, and of taking every precaution to safeguard the newly-born infant against infection.

[The critic will hesitate as to the fitness of the diagnosis of pneumonia in the cases described, and will await further confirmation. No cultures appear to have been made except in three of the special hæmorrhagic cases; in one there was obtained a pure culture of *Bacillus coli*, in a second *Staphylococcus aureus*, while in the third no organism was detected. In view of the apparent specificity of the lesion, this variability in cultural results, coupled with the nature of the organisms found, is in itself a serious criticism.—F. L.]

REFERENCE.—[1]*Brit. Med. Jour.* 1922, i, 469.

## PNEUMONIA, LOBAR.

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

Thomas[1] discusses the treatment by **Serum** of Type I pneumonia cases, and shows that, whereas in 177 cases not so treated the mortality was 11·3 per cent, in 433 cases treated with serum the death-rate was 12·9 per cent. He also gives an interesting table showing the mortality-rates in the different types of lobar pneumonia as seen in St. Luke's Hospital from 1917 to 1921:—

| Type | No. of cases | Deaths per cent |
|---|---|---|
| I | 60 | 15·0 |
| II | 26 | 34·8 |
| III | 35 | 60·0 |
| IV | 118 | 18·6 |

Thomas suggests that the apparent benefit from the serum treatment described by others is the result of the over-estimation of the mortality in cases not so treated.

Maguire[2] considers that the treatment of Type I pneumonia is of undoubted value, and urges that lack of success is due largely to not giving the serum early enough in the disease or in sufficiently large amounts. In 495 cases treated with serum the mortality was 10·5 per cent, as opposed to the ordinary death-rate of 25·3 per cent in Type I pneumonia.

Prigge[3] considers it important to **Raise the Blood-pressure** at critical stages in lobar pneumonia. For this purpose he injects into a vein hypertonic salt solution, 25 grm. in 100 c.c. of water. He finds the salt is retained by the body instead of being discharged by the kidney in a day or two as occurs in control cases, and the blood-pressure rises 15 to 35 mm. of mercury. The raised blood-pressure persists for six or seven hours. This technique would appear to offer a means occasionally of tiding a severe case over a critical period.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1921, Dec. 21; [2]*Boston Med. and Surg. Jour.* 1920, March 23; [3]*Deut. Arch. f. klin. Med.* 1922, April 18.

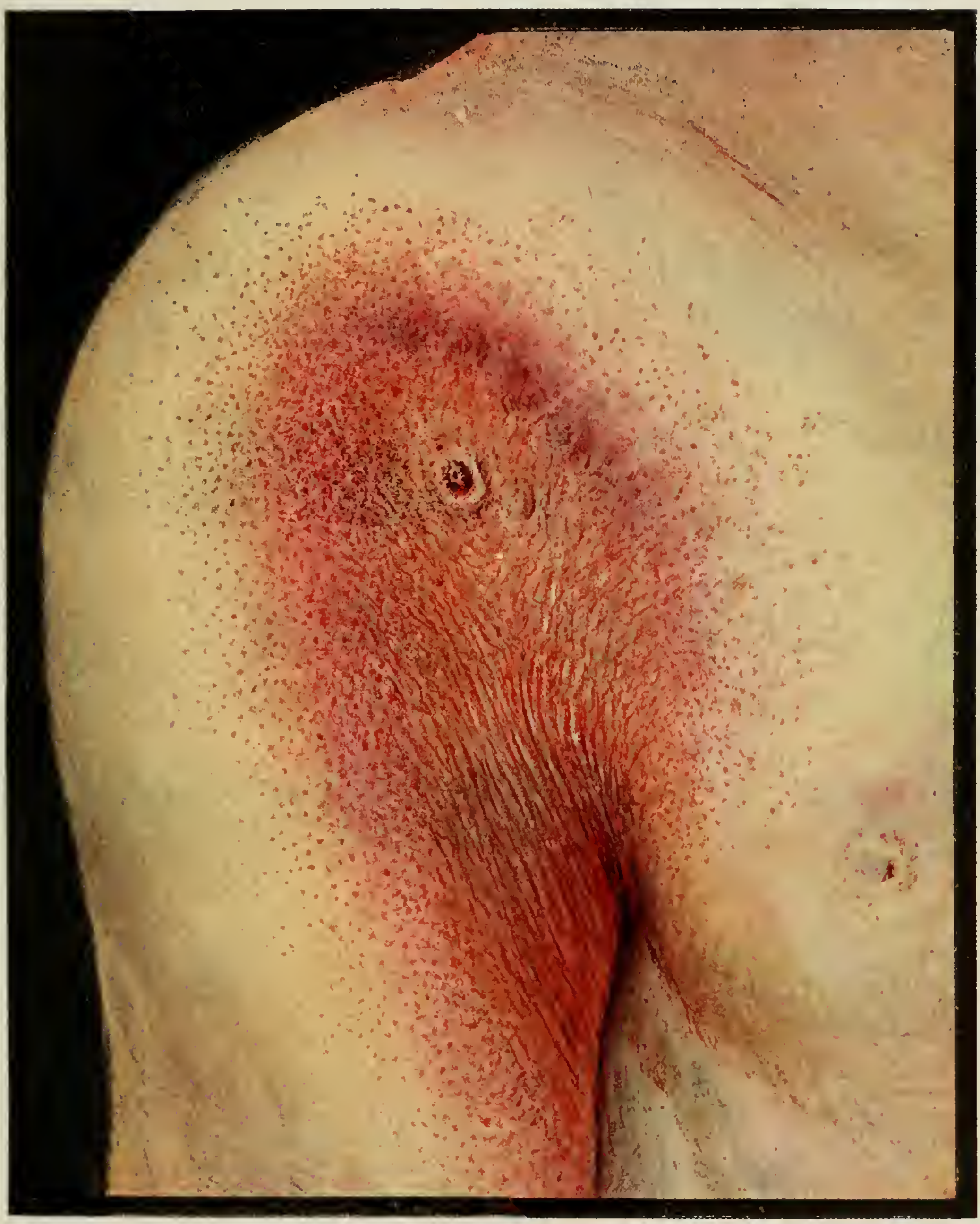
## POIKILODERMA ATROPHICANS VASCULARE.

*E. Graham Little, M.D., F.R.C.P.*

Lane[1] reports a case of this excessively rare disease, the chief points of which are extensive telangiectases and petechiæ, pigmentation—generally reticulated—and some ulceration and atrophy. Lane tabulates the cases previously reported, 12 in number, mostly of German observation, and records his own case in full, and another shown by Ormsby, in which a biopsy was made. No case, as far as I know, has been reported in this country, but I saw an admirable example of the disease in Nekam's clinic in Budapest in 1913. As the disease is so rare, the full description given by Lane is here appended, and the distribution of the lesions in his case is shown in *Plates XXXII* and *XXXIII*, the drawings of which have been kindly lent by him. There is much difference of opinion as to whether the disease is *sui generis* or an abnormal example of scleroderma. Most authorities at present regard it as not falling within the category of

# *PLATE XXXII.*

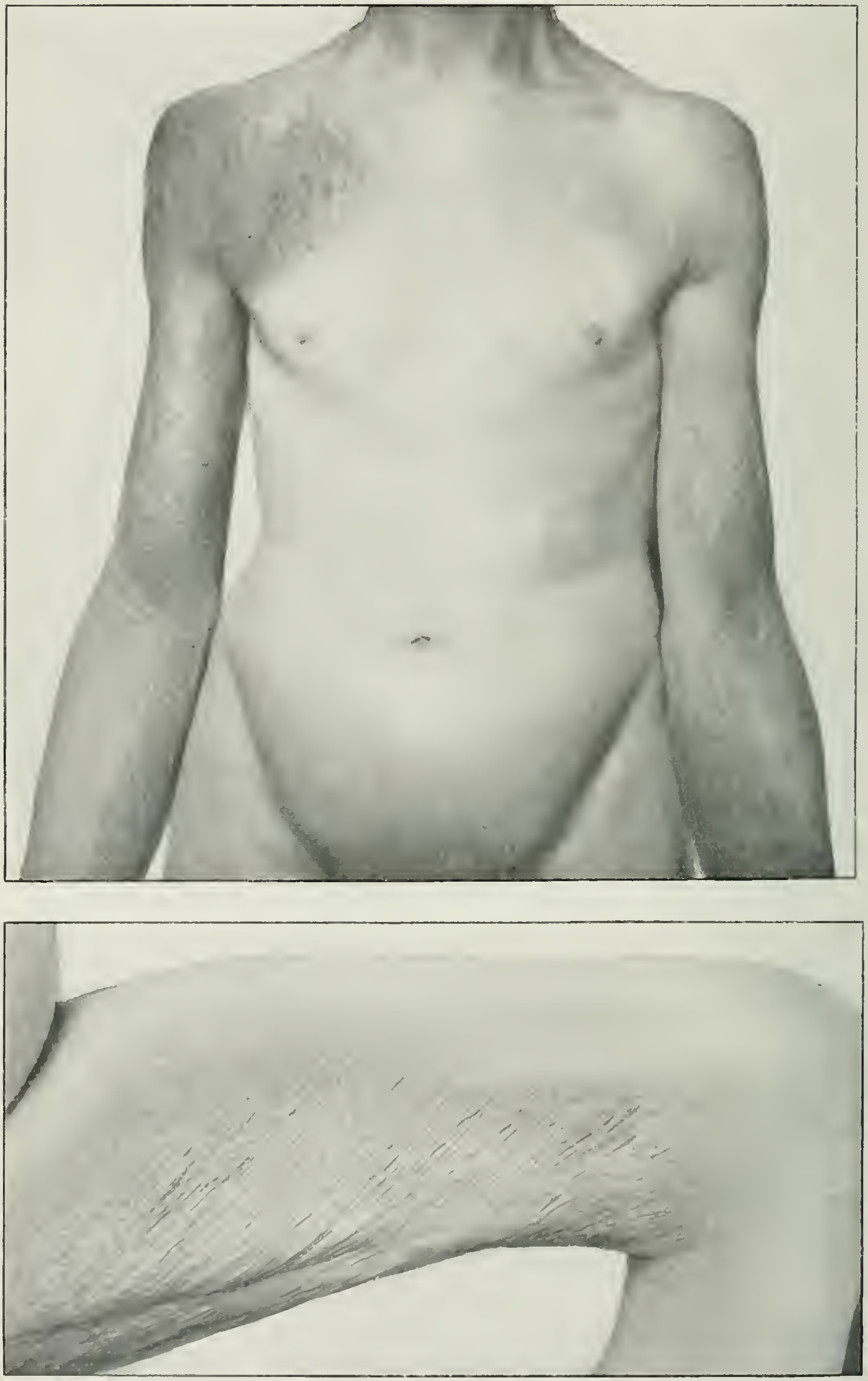
## POIKILODERMA ATROPHICANS VASCULARE



Distribution of lesions in case reported by Dr. Lane.

# PLATE XXXIII.

## POIKILODERMA ATROPHICANS VASCULARE—*continued*



Distribution of lesions on front of body and on leg in Dr. Lane's case.

any other recognized condition, so that until we have further knowledge its classification as a separate entity is advisable. Its etiology is entirely obscure.

Examination of the skin revealed nothing abnormal as regards the scalp, face, neck above the clavicles, hands and feet. Covering a large portion of the rest of the body was a nearly symmetrically distributed eruption presenting many different appearances in which the most striking features were telangiectasia, minute petechial hæmorrhages, pigmentation, atrophy, and ulceration.

On the anterior surface of the right arm the telangiectases and pigmentation were quite evenly distributed, covering the whole surface and extending on to the chest as far as the centre of the clavicle and into the axilla. The telangiectasia was marked, and the whole surface was bright red, quite uniform for the most part, but in various places exhibiting small areas of normal skin showing as light points. Interspersed with the telangiectases were petechiæ, in this and other locations in which the eruption was profuse. Towards the borders the eruption gradually faded, and the pigment was more easily seen, of a reddish-brown to brown. On the inner surface of the arm the eruption was less pronounced, and the telangiectasia and pigmentation were more discrete and presented a somewhat reticular arrangement. In the bend of the elbow the reticular arrangement was quite striking, the small normal folds of the skin being of normal colour, and the skin between them being pigmented and the vessels dilated. The appearance of the inner and posterior surface of the forearm was about the same as that of the inner surface of the arm. The large veins on the inner and posterior surface of the arm were covered by normal skin and gave the appearance of white lines in the surrounding reddish area. The left arm and forearm had about the same appearance except that the arm was not so much affected as its fellow.

The mediothoracic regions, front and back, were not much affected. The rest of the chest was more or less covered with telangiectases and small spots of pigmentation, much less close together than on the arms, the waist being more affected than the other regions.

The buttocks were covered, and the eruption here was evenly distributed and of uniform colour, of about the same density as that on the forearms. The appearance of the posterior and the upper outer surface of the right thigh was similar to that of the arms, except that in many places the pigmentation and also the telangiectases were discrete and appeared as pinhead-size points, of reddish brown, which appeared often to coincide with the openings of the hair follicles. There was no hair on the thighs, and the patient stated that there had never been any since he could remember. On the inner surface of the thigh there was a large oval patch the borders of which gradually merged with the normal surrounding skin. As the centre was approached the pigmentation and telangiectasia were more marked, and atrophy was found, which appeared as light-coloured, irregular spots, showing clearly in the surrounding deep-red skin. At the centre of this area was a scar of a healed ulceration about the size of a quarter of a dollar, with varicosities of the large superficial veins near by. The skin in this and other atrophic spots was soft and pliable, with no sclerodermic hardening. The inner surface of the left thigh was of the same appearance as the right, except that the patch of deep pigmentation and atrophy extended over almost the entire surface as far as the knee, and showed no ulceration. The posterior surface was of a quite different appearance. It was entirely covered with a large patch, in the centre of which the skin was thin and atrophied, shiny and markedly wrinkled. This part was of a uniform reddish-blue livid colour. Just above the popliteal space the skin was of a deeper red, and the folds were exaggerated and contained a few small light-coloured atrophic areas and many large varicose veins.

The appearance in the popliteal space was similar, and the varicose veins were prominent. The popliteal space of the right leg was not so markedly affected, the appearance being similar to that of the buttocks. Varicose veins were distinct but not prominent.

The appearance of the left leg was for the most part similar to that of the arms, and of the upper outer surface of the right thigh ; but there was an area of deep pigmentation and atrophy, with the scar, about the size of a quarter of a dollar, of a healed ulceration on the antero-external surface. There were distinct varicose veins on the inner side of the leg, and some œdema above the shoe line. There were the same œdema, and the same varicose veins, on the right leg. In addition, there was a large surface extending around the entire leg from the ankle to the upper third of the leg, somewhat higher in front than at the back, which had the appearance of the ordinary varicose ulcer of the leg, on an area of atrophy such as was described on the back of the left thigh. In the centre, there were two healed ulcers and one open one, each about the size of a quarter. There was slight scaling of the lesions on arms and legs.

Histology.—Four pieces of tissue were excised from areas presenting differing clinical pictures. The epidermis was well formed in most areas. Over certain areas in which collections of cells were present in the corium, the epidermis was thinned. The corium presented changes in the collagen, elastin, and vessels. There was much cellular infiltration, which occurred in groups, columns, about vessels, and irregularly disseminated. The cells were round and oval, and of the connective-tissue type. The collagen stained poorly and presented evidences of degeneration. In some sections elastic tissue was absent, in others broken and irregularly placed. The vessels were dilated, and in many areas surrounded by a cellular infiltration. Pigment was present in the corium in sections taken from clinically pigmented areas. This was apparently of blood origin. Some coil glands were present, and a very few hair follicles and sebaceous glands remained. The histological picture was therefore entirely unlike lupus erythematosus, and presented the features common in cutaneous atrophy.

Reference.—[1]*Arch. of Dermatol. and Syph.* 1921, Nov., 563.

## POLIOMYELITIS, ACUTE (Infantile Paralysis). *J. Ramsay Hunt, M.D.*

Lovett[1] analyses 180 consecutive cases of poliomyelitis which occurred in 1916, since which time the patients have been under continued care in the clinic of the Harvard Infantile Paralysis Commission. Their cases have been analysed with regard to the effect of treatment on the disease, and to the existence of any general laws governing either the recovery-rate of different muscular groups or the behaviour of the disease as a whole.

The patients are re-examined once in four months, the examinations including every available muscle group of both arms, both legs, back, neck, and abdomen. The degree of existing power is classified, and the muscles are grouped according to their voluntary power as follows : (1) Normal ; (2) Good, when the muscle performs full function, and takes some resistance ; (3) Fair, when the whole arc of motion is performed, but very little resistance is required to overcome the movement ; (4) Poor, when there is some motion, but complete motion cannot be accomplished against gravity ; (5) Trace, when there is muscular contraction but no motion in response to voluntary effort ; (6) Gone, when there is no response in the muscle to voluntary contraction. At the clinics, exercises are prescribed which are to be carried out at home, or they are given at the central clinic, as the case may be. Operations are ordered when necessary, and apparatus is provided and supervised.

There are two phases of the report: (1) The general progress of the cases available for observation, through the whole three years; (2) The behaviour of the cases in the third year. The conclusions that may be drawn from his brief summary of a very large field are that infantile paralysis affecting the upper extremity is milder and more amenable to improvement and cure than that affecting the lower extremity. Muscles in the upper extremity, under the treatment described, improve continuously for four years, the improvement being most rapid in the first year; in the lower extremity, improvement is also most rapid in the first year; but after the third year there is a tendency toward a slight loss of muscular power, especially marked in the lower leg, under the best conditions of intensive treatment that can be afforded in a public clinic where the object of treatment is the prevention of deformity and the avoidance of fatigue, and where muscular re-education is pursued throughout. The chief cause of this loss is deformity, and deformity occurring in the lower leg.

The following causes tend to make recovery in the lower leg less favourable than elsewhere in the body, except in the abdominal muscles: a tendency of the paralysis to be more severe from the start, the frequent occurrence of deformity, and the fact that in weight-bearing the greatest amount of strain is thrown on the muscles of the lower leg. The outlook in the tibials is particularly poor; and the more favourable condition in the peroneals explains the predominance of valgus deformity. Operation may temporarily diminish muscular power, and improved function occurs before the improvement in muscular power shown by a technical examination.

The lesson to be learned is that deformity is to be prevented by every means in our power, that the evidence shows that early weight-bearing is detrimental to weakened muscles, and that the keynote to treatment consists in the prevention of the stretching of paralysed muscles and contraction of their opponents, the avoidance of fatigue in walking, and the preservation of a normal muscular balance between opposing groups so far as possible. With this closer analysis of the potential power of individual muscles to improve, and the general laws formulated with regard to the behaviour of individual muscles, it would seem that operation in a good many cases might be performed with benefit earlier than is now done, and that one was safe in formulating the statement that deformity, stretching, and fatigue are the three worst enemies of good ultimate function in poliomyelitis.

Peabody[2] presents a report of the Harvard Infantile Paralysis Commission, with special reference to the incidence of cases without paralysis. Special interest is attached to the cases seen first in the preparalytic stage of the disease. There is general agreement among authorities that epidemic poliomyelitis usually manifests itself first as an acute general infection in which symptoms develop suggesting involvement of the meninges. Stiffness of the neck, with resistance and pain on flexion, is one of the earliest and most characteristic signs. There is nothing pathognomonic about the clinical picture before the onset of paralysis; but there is much that is suggestive, so that during an epidemic the diagnosis is often suspected and later confirmed by the development of typical palsies. In the preparalytic stage the most helpful diagnostic method is lumbar puncture, for experience has shown that in a large proportion of cases there is an increase of the cells in the spinal fluid. Draper has demonstrated that in the earliest phase of the disease in certain cases, the spinal fluid may be normal, and the increase in spinal fluid cell-count may develop after several days; but without the pleocytosis it is difficult or impossible to make a definite diagnosis in the preparalytic stage. A review of the therapeutic results reported since 1916 left the Harvard

Commission unconvinced as to the demonstrated value of any method thus far suggested, and they decided in 1920 that they would not make any representations with regard to specific treatment in the acute stage. The Commission offered the services of its representatives simply as diagnosticians. This gave an opportunity for the collection of data regarding the natural course of the disease and the frequency of the development of paralysis. There were only 13 cases in which the clinical picture, the pleocytosis in the spinal fluid, and the subsequent history of the case, justified the diagnosis of acute poliomyelitis in the preparalytic stage.

An analysis of this group of cases showed that only 4, or 31 per cent, became definitely paralysed, while 9, or 69 per cent, did not develop any paralysis. A similar group of untreated cases is reported by Draper, and of the 30 patients concerning whom the outcome is stated, 19, or 63 per cent, escaped paralysis. Both of these sets of figures are too small to be of great significance; but they represent a type of information which should be diligently collected whenever the opportunity arises. In all probability the incidence of paralysis in patients infected with acute poliomyelitis varies in different epidemics, at different periods in the same epidemic, and among different groups or ages at the same period in an epidemic. It is of interest in this connection to review some of the therapeutic results which were obtained by various observers who used specific methods of treatment in the epidemic of 1916. The Harvard Infantile Paralysis Commission treated 51 cases in the preparalytic stage by intravenous injection of the **Serum** of patients who had recovered from the disease, and 35, or 69 per cent, recovered without paralysis. Draper treated 46 cases in the same stage with a similar serum, and reported 20, or 43 per cent, escaped paralysis. Amoss and Chesney used intraspinous and subcutaneous injections of serum of recovered cases in 14 patients, and in 10, or 71 per cent, no paralysis developed. Zingher used the same type of serum intraspinally in 54 cases in the preparalytic stage, and in 44, or 82 per cent, no paralysis occurred. In the Willard Parker Hospital 25 of this group were seen, and 24, or 96 per cent, did not become paralysed. On the other hand, 9 out of 10 cases treated by Zingher by intraspinous injection of normal serum also failed to develop paralysis. Rosenow prepared a serum by the inoculation of horses with a streptococcus isolated by him from human cases of poliomyelitis, and administered it intravenously in the treatment of patients in an epidemic at Davenport, Iowa, in 1917. Sixteen cases in the preparalytic stage were treated, and in none of them did paralysis develop. Considering the fact that the evidence at hand indicates that about 65 per cent of patients infected by acute poliomyelitis never develop paralysis if untreated, the results of these small series of cases cannot be regarded as carrying great weight. In a disease in which a favourable outcome is apparently more commonly the rule than the exception, it is particularly important to be extremely critical with regard to therapeutic measures.

The results of treatment with **Immune Horse Serum** are given by Rosenow,[3] as follows: For purpose of study, the patients in each series were divided into three groups according to their condition at the time of treatment: *Group* 1, patients in the pre-paralytic stage; *Group* 2, patients with slight paralysis; and *Group* 3, patients with advanced paralysis. The cases summarized in the table represent the series which he treated in the epidemic at Davenport (58 cases), the epidemic at Dubuque (58 cases), and sporadic cases (15) since those epidemics, 131 in all, and 128 cases treated by physicians to whom the serum was sent.

Following the administration of the serum during the febrile stage, the temperature and the pulse-rate were lowered in a high percentage in each of the four series of cases. Abolished reflexes returned, or diminished reflexes became stronger. Often restless, hyperæsthetic, irritable, and wakeful children went to sleep soon after the injection, and the mental condition even of semi-comatose, apathetic children became normal within a short time. Often progressive paralysis was arrested, or groups of weakened muscles showed increased power very soon after the injection, provided it was given soon after weakness appeared. Post-paralytic pains and slight increase in the function of muscles occurred even as late as ten days after the onset of paralysis.

SUMMARY OF RESULTS, ACCORDING TO GROUPS OF ALL PATIENTS TREATED WITH THE SERUM.

| Condition of patients | Patients | Deaths | Recovery with residual paralysis | Complete recovery | Recovery without developing paralysis | Early good effects | Late results unknown | Effect doubtful or not apparent | Average cell-count | Average duration at the time of first serum treatment, days | Average age, years | Average amount of serum given each patient, c.c. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Group* 1, patients without paralysis at time of serum treatment | 60 | 0 | 0 | 60 | 59 | 59 | 0 | 1 | 114 | 1·7 | 5·3 | 18 |
| *Group* 2, patients with slight paralysis at the time of serum treatment .. | 61 | 0 | 1 | 60 | 0 | 58 | 0 | 3 | 120 | 2·1 | 5·4 | 22 |
| *Group* 3, patients with advanced paralysis at the time of serum treatment .. | 123 | 18 | 30 | 61 | 0 | 74 | 14 | 34 | 117 | 5·8 | 7·2 | 32 |
| Sporadic cases .. | 15 | 1 | 6 | 8 | 0 | 12 | 0 | 3 | 148 | 3·4 | 5·3 | 49 |
| Total .. | 259 | 19 | 37 | 189 | 59 | 203 | 14 | 41 | 119 | 3·8 | 6·2 | 27 |

None of the sixty patients of *Group* 1, treated in the preparalytic stage, died, and all recovered completely without residual paralysis. Paralysis developed in only one of these, and in this one it was slight. Early good effects, such as diminution in the temperature and pulse-rate, and lessening of rigidity of the neck and spine, were noted in all but one of these cases.

Of 61 patients in *Group* 2, with slight paralysis at the time of the serum treatment, all but one recovered completely, and in this one residual paralysis was limited to the shoulder muscles. Early good effects were noted in all but three of the patients in this group.

Of the 123 patients in *Group* 3, with advanced paralysis, 18 died; 11 of these had symptoms of involvement of the medulla at the time of treatment; 30 have residual paralysis; in 14 the late results with regard to the paralysis are not known; 61 recovered completely.

He concludes that immune horse serum, prepared by repeated injections of increasing doses of freshly isolated strains of the pleomorphic streptococcus, has curative power in poliomyelitis, especially when given in the early stage.

Its general use in the treatment of this dread disease is indicated, and the need for early diagnosis in suspicious cases by spinal puncture is again emphasized.

## SURGERY OF INFANTILE PARALYSIS.

This subject is reviewed by Rugh.[4] Treatment consisted entirely in the application of some form of brace, of massage, and manipulation, until the introduction of subcutaneous tenotomy by Stromeyer, of Hanover, in 1831. This simple operation was the first great surgical procedure for the easy correction of many of the malformations associated with paralysis, and formed an epoch in the surgery of deformities. No further advances were made in the surgery of this condition until 1878, when arthrodesis for the stabilization of certain joints was performed and advocated by Albert, of Vienna. The next epochal advance in the surgery of these deformities was brought out by Nicoladoni, who, in 1881, first transplanted one of the peroneal tendons into the tendo Achillis in a case of calcaneus; this was the beginning of the development of that branch of work which has held the attention of orthopædic surgeons to the present day. In these earlier cases transplantation was always performed by inserting tendon into tendon, and the results of the work in a large percentage of the cases proved disappointing because of the failure of the attachment to become permanent. In 1897, Goldthwait first reported the direct transplantation of muscles in the treatment of paralytic deformities, and about the same time Fritz Lange employed long silk cords for the transmission of power from a live muscle to a paralysed part.

The surgery of paralysis of this era has now become obsolete. The insertion of tendon into tendon has been found entirely insufficient because of the stretching of the parts. The use of silk ligaments for the stabilization of a joint or the maintenance of a part in a given position or for the preservation of the continuity of a tendon for the transmission of muscle power, which at first offered such promising results, and appeared to be the method which would afford the greatest relief and benefit in the treatment of these conditions, proved totally unreliable after trial.

The active surgery of infantile paralysis is usually classed under the headings of corrective and reconstructive. The first includes those operations done during the stage of recovery from the attack of the disease, and before the resultant or permanent paralysis has become established. The second includes the operative work after all possible recovery has been obtained and the need is present for the building up and restoration of as much essential function as possible. During the first two years of the disease surgery must be of the most elementary type, and much greater reliance must be placed upon mechanical and restorative means of treatment, such as physiotherapy, hydrotherapy, etc. The tendency on the part of many operators is to do too much and too radical surgery in the earlier years of the disease, and it not infrequently happens that they destroy the chances of recovery in certain parts that would be of the greatest benefit to the patient. Prevention of deformity and correction by the simplest procedures are the keynote of the surgery during the stage of active regeneration and recovery from the attack. After this period has elapsed, we may consider the second type of surgery, viz., constructive. The aim of this is to preserve as many of the functions in the part as possible, rather than the establishment of one or two essentials.

The operation of tendon transplantation, both direct and indirect, has proved a very great advance in the surgery of infantile paralysis; but it is gradually reaching its level of efficiency and success, and it is safe to say that the next ten years will see a much smaller number of cases operated upon by this method than by some of the others. Conservatism in this field is becoming more and more pronounced, and the limitations of tendon transplantation are being much more accurately defined. It is now generally conceded that it is practically useless to do it prior to ten or twelve years of age. This is true by reason of the fact that prior to this age it is almost impossible to secure the co-operation of the patient for the development of the special functions in the transplanted tendons.

For the resultant paralysis (that which persists after five or six years have passed), when the probability of any further regeneration of muscle and nerve tissue or of nerve cells is entirely gone, another type of surgery can be considered, and its most useful field is in the correction of many of these permanently crippled and deformed cases. This is really the third type of surgery, which can be well termed 'reconstructive', because it has for its purpose the rebuilding of a part or parts for the purpose of establishing one or two essential functions in the part even though it be at the expense of all other functions. Under this heading are included operations—generally of a destructive character—such as arthrodesis, resection, cuneiform osteotomy, tenodesis, bone transplantation, and the construction of ligaments out of tendons, fascia, and other structures.

References.—[1]*Jour. Amer. Med. Assoc.* 1921, Dec. 17, 1941 ; [2]*Boston Med. and Surg. Jour.* 1921, Aug. 11, 174 ; [3]*Jour. Amer. Med. Assoc.* 1921, Aug. 20, 588 ; [4]*Ann. of Surg.* 1921, July, 61.

## POSTURAL SUBSARTORIAL BURSITIS.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

R. Davies-Colley[1] writes: My object in this communication is to draw attention to a form of postural bursitis which has, as far as I am aware, never before been described. I had more than once met with cases of chronic inflammation and enlargement of the subsartorial bursa for which I could not account, before I discovered its very simple causation and its equally simple and most effective treatment. It was, in fact, only when I developed the condition myself and was puzzled to know why the swelling of the bursa and the accompanying pain were always greatest when I first stretched my legs in the morning, that the explanation suggested itself that it was indeed the night's rest that was the cause of the lesion. It is simple enough ; if one lies on one's side in bed with one knee resting upon the other, the inner tuberosities of the two tibiæ with the overlying tendons of the sartorius muscles and their bursæ are pressed directly against one another. It is, I believe, nothing more than this pressure that is the cause of the bursitis. It is, at any rate, a fact that if the pressure is taken off the tuberosities by one means or another the inflammation of the bursa rapidly subsides and does not return. I have met with some ten or a dozen cases during the last few years, about equally divided between the sexes.

Symptoms.—The symptoms are characteristic. They are: (*a*) Pain in the region of the inner tuberosity of the tibia on movement, especially marked during the first hour or two after rising in the morning. The pain develops gradually and without apparent cause ; at first it may amount to no more than a mere stiffness which passes off during the day; but later, when the bursa swells, it causes much discomfort and lameness. (*b*) Swelling over the tibial attachment of the sartorius muscle. This may be limited to the bursa, which becomes definitely outlined and can be shown to fluctuate. The amount of the swelling is seldom very great, though in one of my cases the sac was as large as a pigeon's egg, and quite tense. At other times the swelling is diffuse, and there is inflammatory œdema of the subcutaneous tissue over a considerable area as well as enlargement of the bursa. In these cases the skin is red, and more or less acutely tender.

Diagnosis.—The diagnosis ought to present no difficulty, though every case referred to me has arrived with an erroneous one. The mistake has usually been to attribute the symptoms to disease of the head of the tibia or of the knee-joint, and chronic periostitis, abscess, and exostosis of the former, and internal derangement, early tuberculous disease. osteo-arthritis, and Morant Baker's cyst of the latter, have all, at different times, been held responsible for them. The definite localization of the pain and tenderness to the position of the bursa, the absence of excess of fluid in, and the perfect freedom of movement of, the joint, and the lack of any history of trauma should be enough to exclude disease of the knee. The differential diagnosis from lesions of the bone may not be so easy, especially as an inflamed bursa is not uncommon over an exostosis in this situation; but if there is any doubt a radiogram will at once clear it up.

Treatment.—If the cause of the bursitis is borne in mind the treatment will be obvious. Either the patient must be induced to sleep in such a position that the knees do not rest upon one another, or, better, a thick pad of wool should be worn at night over the inflamed bursa, so that if the knees do come into contact the pressure will be distributed, and the tuberosities of the tibiæ will not impinge directly upon each other. It is quite unnecessary to wear the pad during the day.

In all my cases the latter method of treatment has been rapidly and completely successful.

Reference.—[1]*Lancet*, 1922, i, 1096.

## POSTURE TREATMENT.

*Loring T. Swaim, M.D.*

Many functional disturbances of the body are due to improper mechanical conditions, the result of the habitual wrong use of the body. This is called faulty mechanics.

Habitual correct bodily mechanics is the position of least strain to muscles, joints, and bones, and the one in which the thoracic and abdominal organs have normal space and are not interfered with by pressure, constrictions, and lack of support.

Incorrect positions are those that cause strain and pressure, which, if continued, result in disturbance of harmony and adjustment of the thoracic and abdominal organs. Temporary bad positions do no particular harm; but when they are repeated often enough and become habitual attitudes, they cause serious interference with normal health, vitality, and endurance.

The typical faulty posture is one of round shoulders, relaxed abdomen, increased lordosis, with the inevitable forward position of the head, flat chest, low ribs, small costo-sternal angle, sprung knees: the typical slouched attitude. This is the position of extreme fatigue, where muscle support has given way. In this position the lungs are crowded down, the suspensory cervical fascia of the diaphragm is relaxed, resulting in a lower diaphragm; the contracted ribs push all the abdominal viscera down out of place, and as the abdominal muscles are relaxed automatically in this position, there is nothing to support the organs of digestion. Inevitably the liver, spleen, kidneys, stomach, and intestines are displaced. Besides the displacement, there is the pressure on them of the constricted upper abdominal space. Normal functional capacity is impossible, and disturbances of digestion, excretion, and secretion result.

In the erect, commanding position, instantly we have recognized power. Here the head is up, chin in, chest high, dorsal and lumbar spine straight. The abdominal muscles have supporting tone, and the weight is easily carried on the balls of the feet. There is the least possible strain for the back and feet, because the muscle balance is nearly equal in all sets of opposing groups of muscles. Especially is this position important when we realize that there is no crowding of the great organs which supply us with energy, vitality, and endurance.

To determine their habitual posture, patients should be examined standing up, because often it will explain many of their symptoms and complaints, as well as explain the strange vitality even in the face of serious organic disease. Most cases come, not with organic disease, but with functional disturbances, and we have not done our best for such patients unless we have found the cause for the disturbances. Many obscure symptoms disappear rapidly with change in the bad postural use of the body.

When one analyses correct and incorrect posture, it is surprising to note the bad positions used for rest. Presumably one wishes to rest as quickly and effectively as possible ; yet we lie down at night with one or more pillows under the head, in a bed which frequently sags. We assume the worst position for the normal, easy functioning of the vital parts of our machinery. We cramp it all night long. We even place our patients, who are struggling to combat some disease, in this faulty position, both day and night, and expect them to get well. Would it not be more logical to place them and ourselves in a flat position where the abdominal organs can have enough room to do their best work, where the heart and lungs can work most easily ? The same is true of our chairs. They invariably force the body into incorrect buckled positions which cramp and squeeze the organs of digestion, assimilation, and excretion. It is instinctive to yearn after such a false position ; it is nature's method of correction of posture and easing of cramped organs.

Often it is sufficient only to direct the attention to such fundamental truths ; but with some it requires much physical training, and, not infrequently, mechanical corrective supports, to overcome the real deformities resulting from round shoulders and excessive lordosis. The muscles cannot, through long-continued incorrect use, resume their normal tone. This is particularly true in certain arthritic cases where stiffness has occurred in bad positions of the spine.

Much correction can be accomplished by simple bed positions at frequent intervals. One such position for correction of the low diaphragm, round shoulders, and contracted ribs, is called hyperextension. This is simply accomplished by placing a pillow under the shoulders in a lying position. This raises the chest simply through the weight of the body resting across the pillow. The correction of posture is increased by raising the arms above the head, thus using the pectoral muscles to help raise the ribs. This position can be modified by the height of the pillow to any degree, and the length of time can be graded to individual cases. The usual time is about one half-hour three times a day. Much can be done to correct lordosis by lying on the face with a pillow under the body, highest at the point to be straightened out.

Exercises are of great importance, especially stretching exercises directed toward raising the chest and diaphragm and the development of the abdominal and back muscles. Deep breathing with stretching and reaching exercises will expand the chest with surprising rapidity. Many of these exercises are best done lying down at first, until the body has begun to correct.

It is surprising to see how quickly normal functions return, even after years of mal-functioning, when the organs of the body are not interfered with by postural deformities. Correct use of the body seems to be essential to full capacity and harmonious activity of the thoracic and abdominal organs, and incorrect bodily mechanics is one of the chief causes of lack of vitality and functional ill-health.

**POTT'S DISEASE.** (*See* Bones and Joints, Surgery of.)

## PREGNANCY, DISORDERS OF.

*W. E. Fothergill, M.D.*

*Eclampsia.*—Thomas Watts Eden[1] writes a commentary on the reports presented to the British Congress of Obstetrics and Gynæcology which was held at Liverpool in June, 1922. The mean mortality of the 2005 cases investigated is 22·5 per cent, the district mortality being as follows: London, 21·9 per cent (547 cases); Edinburgh, 25 per cent (148 cases); Dublin, 10·29 per cent (204 cases); North of England, 24·43 per cent (804 cases); Midlands, 25·1 per cent (302 cases). The low Dublin mortality is the outcome, at any rate in the main, of the special method of treatment in use there. The infantile mortality is very high and must inevitably remain so; it is influenced by the prematurity of a large proportion of the infants. In Dublin 65·6 per cent and in Edinburgh 44·4 per cent of the infants survived, the other districts occupying positions between these extremes. As to predisposing causes, the patients were primigravidæ in 69·3 per cent and multiparæ in 30·7 per cent of the cases investigated; but the mortality was greater in the multiparous women than amongst the primiparæ. Twin pregnancy is a predisposing factor, its frequency amongst the cases in question being 4·7 per cent, while the average incidence of twins is only about 1 per cent. Thus the liability to eclampsia is four or five times greater in multiple than in single pregnancy.

Premonitory symptoms, in cases investigated, appear to have been noticed in 84·7 per cent. The cases in which they were absent do not seem to have been any more severe than the others, for they show a mortality of 16·8 per cent, against the mean mortality of 22·5 per cent. The figures also indicate that in four out of every five cases there would be time for prophylactic treatment if the importance of the premonitory symptoms was generally understood. The following seven phenomena appear to be danger signals: coma, a pulse-rate over 120, a temperature above 103°, a number of fits greater than 10, a urine which becomes solid on boiling, the absence of œdema, and a blood-pressure over 200 mm. When a patient exhibited any two of the above phenomena the case was generally grouped as a severe one. The mortality was much higher in the cases so grouped than in the remainder.

The influence of the method of delivery upon the mother's chances of survival can be gleaned from the following mortality-rates:—

| | Mild cases | Severe cases |
|---|---|---|
| Natural delivery .. .. | 4·5 | 36·9 |
| Assisted delivery .. | 5·6 | 31·7 |
| Induction of labour .. | 6·6 | 26·4 |
| Cæsarean section .. | 11·3 | 46·3 |
| Accouchement forcé .. | 18·1 | 63·1 |

These results constitute a very forcible plea for restraint in the obstetric management of eclampsia. Cæsarean section, and especially forcible dilatation of the cervix, diminish the patient's chances of recovery instead of increasing them. (*See also* Cæsarean Section.)

Eden remarks that during the last twenty years the treatment of eclampsia has been based upon two antagonistic views: the one, that obstetric interference should be practised early; and the other, that obstetric interference should be avoided until the second stage of labour is advanced, and that the toxæmic condition should be treated by simple medical measures. The hospital treatment of to-day is in a state of discreditable muddle and disorder. An exception must be made in favour of Dublin, where a uniform plan of expectant treatment has been followed for some years, with results of the most encouraging character. (*See* MEDICAL ANNUAL, 1918, p. 433). Eden considers that, in the present state of knowledge, we can hardly go beyond the following simple propositions :—

1. It is easier to prevent eclampsia than to cure it. Prophylaxis is therefore all-important. Premonitory symptoms appear in 84 per cent of cases, the most common being albuminuria and œdema. Headache, disturbances of vision, and epigastric pain—sometimes with vomiting—are also usual. Patients treated for these symptoms very rarely have fits. The treatment consists in **Bed, Fluid Diet** only (mostly water), **Purgatives, Diuretics.** The salient points to be watched are the amount of urine, the amount of albumin, and the blood-pressure. If progress is unsatisfactory, labour should be induced whether the child is viable or not.

2. Prompt removal to a hospital is the first requisite after one fit has occurred. Eclampsia calls for hospital resources as urgently as the most serious surgical operation.

3. A simple classification of cases into 'mild' and 'severe' groups upon the lines indicated above would facilitate treatment and would much increase the value of clinical records.

4. All cases of eclampsia, whether mild or severe, are best treated with the minimum of obstetric interference.

5. Simple medical treatment, carefully regulated and closely watched, gives the best results. The lines laid down by Stroganoff and Hastings Tweedy are those to be followed, but the last word has not been spoken by either of these distinguished clinicians.

Bethel Solomons,[2] at the Liverpool Congress, called attention to the following special points in the Rotunda treatment :—

1. **Starvation.** Nothing is to be given except water. How long may this be continued ? Usually the patient improves in a day or two. If there is no improvement after three days, then and not until then should **Cæsarean Section** or **Induction of Labour** be recommended.

2. **Stomach Lavage.** This is repeated until the return flow is clear, after which 2 drachms of concentrated magnesium sulphate (*sic*) is left in the stomach.

3. **Bowel Lavage.** A tube is passed 18 inches into the bowel, after which water containing sodium bicarbonate 1 drachm to the pint is poured in and siphoned out. This is continued until the return flow is clear after having been stained by fæcal matter. An hour's work may be required. One or two pints of the solution should be left in the bowel.

4. The use of **Morphine** has until recently been part of the Rotunda treatment, but Dr. Fitzgibbon is now doing without it.

5. The injection of **Sodium Bicarbonate** solution under the breasts should be a part of the routine in all but the mildest cases.

6. The patient should be closely observed by a qualified person, trained nurse, or senior student, in order that she may be prevented from dying by drowning. It may be necessary to swab mucus from the throat and to bring the head and shoulders hanging over the side of the bed with the face turned towards the floor. In this way fluid will frequently be found to pour through the nose and mouth, with immediate relief of dyspnœa.

*Pernicious Vomiting of Pregnancy.*—J. C. Oldfield[3] for more than twenty years has been of the opinion that all cases of pernicious vomiting of pregnancy are neurotic in origin ; the toxæmia which is generally present in these cases he regards as the result, and not as a cause, of the vomiting. He reports upon 29 cases. All the patients recovered, and in one case only was abortion induced. The treatment is simple. The patient is admitted to a hospital or nursing home, and at once put on ordinary diet. The nurses are told that the vomiting is due to neurosis, that a bowl must not be provided even if the patient should vomit, and that the words sickness and vomit must not be mentioned in the presence of the patient. They must just expect her to take her food like other patients in the ward, and must not try to persuade her to do so. As a rule, full ordinary diet is taken and retained, sometimes only a small portion for the first day or two, part of which may occasionally be vomited. In most cases **Rectal Infusion of Glucose,** 4 per cent, is given—as a rule continuously by the drop method. No drugs are used except aperients. The first difficulty is to get the patient to leave home for a hospital or nursing home; but this is essential, and the patient must be under the daily care of the obstetric surgeon who advises the treatment, as it cannot be carried out by another person. When vomiting persists after the patient is in hospital, it must be suspected that she wishes to be rid of her pregnancy. Some put their fingers down their throats. In one case the patient's doctor told her and the consultant that the induction of abortion was necessary to save her life. She improved on admission, but became worse each time her friends visited her. In the end Oldfield gave up the struggle and evacuated the uterus; but he believes that this would not have occurred if he could have had the case to himself. He reviews the various theories that have been advanced in explanation of the vomiting of pregnancy, but finds them not only speculative and unsatisfactory, but also quite unnecessary for purposes of prognosis and treatment.

A. F. Hurst[4] writes on this subject from the viewpoint of the physician and neurologist. He admits the existence of reflex vomiting, but considers that the pernicious vomiting of pregnancy is always hysterical, the condition generally regarded as toxæmic being secondary. He urges the use of the term 'hysterical' as opposed to 'nervous', and insists that the proper treatment is explanation—the best form of psychotherapy. The appearance of the results of prolonged vomiting should not lead to the use of the term 'toxæmic' as a diagnosis, nor to the termination of pregnancy as treatment. The latter is regarded by the writer as only a method of suggestion in these cases, and a very dangerous one.

C. E. Paddock[5] describes a treatment for hyperemesis gravidarum which forms a striking contrast to that used by Oldfield. Paddock passes a tube into the stomach, and in from four to twenty-four hours the end of it appears to pass on into the duodenum. The sign that this has occurred is that clear bile can be aspirated through the tube. "After the tube has settled into place the rest of the cure is simple." The patient is fed and medicated through the tube with **Glucose** 5 per cent and **Sodium Bicarbonate** 2 per cent in water; milk and water, maltose, fruit juices, eggs, and normal saline solution. After about five days of this the tube is removed and the patient then eats and retains boiled eggs, toast, etc.

*Toxæmias of Pregnancy.*—R. L. M. Wallis and H. G. E. Williams[6] have made an experimental investigation of the corpus luteum in its relation to the toxæmias of pregnancy. They found that the commercial preparations of corpus luteum do not appear to contain the internal secretion, and subsequent work made it appear eminently desirable that they should not do so. Their own preparation of fresh corpus luteum was found to be highly toxic. The lesions produced are most marked in the kidneys, in which the effects are immediate. Later, the liver shows changes. Extracts from placenta under identical conditions are not toxic. The simultaneous injection of cholesterol profoundly modifies the effect of injecting the highly toxic synthetic amine, and the authors believe that the body protects itself by means of cholesterol against this poisonous substance. They conclude : (1) From the corpus luteum a chemical compound has been isolated which produces necrosis and other changes in animals very similar to those found in the toxæmias of pregnancy. (2) This substance is not present in the placenta, nor in a hydatidiform mole. (3) The over-production of this substance is the cause of the toxæmias of pregnancy, and light is thrown on the association of the corpus luteum with many of the clinical manifestations of pregnancy.

*Tubal Gestation.*—Salpingotomy versus salpingectomy in the treatment of tubal gestation is the subject of an investigation by Beckwith Whitehouse.[7] Before 1914 the writer, together with J. Wilson, dissected 30 fresh and unhardened specimens of tubal mole, abortion, and rupture. They found that it was always possible to trace the lumen of the tube around and beyond a mole, which, again, was always attached by a narrow base or pedicle to some part of the tubal mucosa. This base never exceeded half an inch in diameter, was usually situated on the floor of the tube, and was always at the proximal end of the mole. When tubal abortion occurs, the pedicle is torn through. Clots may be expelled from the tube through the ostium abdominale without separation of the mole, the conformation of which depends upon the pressure of the tubal wall, the impression of the normal rugæ being frequently observed. The deciding factor as to whether intra- or extra-tubal rupture shall occur is the direct outcome of the combination of tissue erosion and tissue tension. This is influenced by the site of implantation of the ovum in the ampullary, isthmic, or interstitial portions of the tube. The small area of attachment and the ease with which the mole can, in fresh specimens, be detached from the tubal mucosa, suggested to Whitehouse the possibility of removing the mole from the tube *in situ*, and raised the question as to whether we are justified in sacrificing the tube on all occasions. In ten cases he performed salpingectomy and extracted the mole without difficulty. The tube was then removed and examined in detail for evidence of inflammatory change. In all the specimens the tissues appeared to be normal, and the abnormal implantation of the ovum to be purely accidental in origin. Subsequently the writer has saved the tube on five occasions—three cases of mole, one partial tubal abortion, and one tubal rupture. He thinks that in tubal rupture salpingectomy may be the better procedure, but that in tubal mole and abortion salpingotomy may be worthy of trial as an alternative method of treatment. The management of the ovary concerned is not mentioned in this paper ; no doubt it is taken for granted that the ovary will be conserved in all cases when this can be done without impairment of its blood-supply.

REFERENCES.—[1]*Jour. Obst. and Gynæcol. Brit. Emp.* 1922, xxix, No. 3, 386 ; [2]*Ibid.* 416 ; [3]*Ibid.* No. 2, 303 ; [4]*Lancet,* 1922, i, 528 ; [5]*Jour. Amer. Med. Assoc.* 1922, May, 1611 ; [6]*Lancet,* 1922, i, 984 ; [7]*Jour. Obst. and Gynæcol. Brit. Emp.* 1922, xxix, No. 1, 93.

## PROCTITIS.

*J. P. Lockhart-Mummery, F.R.C.S.*

Charles Drueck,[1] discussing the treatment of acute proctitis, advises in severe cases that an anæsthetic should be administered prior to the examination of the rectum owing to the pain it causes, and at the same time the sphincter should be thoroughly stretched. This also enables any foreign body which may be present to be removed. He advises that the bowels should be cleared out with a saline cathartic, and that they should be irrigated two or three times a day with a **Physiological Salt Solution** at a temperature of 110°. The solution is allowed to run into the bowel at a slow rate. After the injection, 2 drachms of 1–5000 **Silver Nitrate Solution** are injected, and a ½-gr. **Morphia Suppository** is inserted into the bowel. Any ulcers that may be present are painted with pure **Ichthyol** through a speculum. The patient should be kept in bed until all pus and blood have disappeared from the stools. Diet should be of the easily digestible variety, and free from coarse cereals. Milk should be forbidden on account of the hard curds which are produced. He believes in the value of **Flax-seed Tea.**

Reference.—[1]*Med. Record,* 1921, Aug. 6, 242.

## PROFESSIONAL SECRECY IN MEDICAL PRACTICE.

*Joseph Priestley, B.A., M.D., D.P.H.*

The subject of professional (medical) secrecy has been much to the fore recently, and will probably be more so in the near future. It may be an advantage to deal briefly with it in the Medical Annual. First, it must be emphasized that the subject must be considered from two points of view, viz.: (1) *the judicial,* (2) *the civil.*

1. In regard to the judicial point of view there cannot be two opinions. It is clear that, as the law of the British Isles stands, *all* information, whatever facts will help the Courts, must be forthcoming, so that the Courts may arrive at the right decisions. It is inconceivable that a medical practitioner should withhold any information, however private and confidential, as without such information there might be a miscarriage of justice. All ideas of British laws are against that. There is no possible reason why the information should not be given to the Court in a private and confidential manner, e.g., *in camera,* i.e., by the exclusion of the public and of the Press, or by the medical witness simply furnishing the judge with a written private and confidential report or communication. With such a proviso as a protection, a medical witness would not be justified in withholding information, and the question of absolute or partial privilege could not be honestly claimed. So far, the matter is simple.

2. Outside a Court of Justice, however, the matter is quite different. The medical practitioner must be a sealed book, and must, in every way, act as a father confessor. Professional honour should alone secure this being so. Here, again, it is inconceivable that there should be any departure from a most salutary practice, and the question of absolute privilege must, in all cases, be rigorously enforced. From this standpoint also, therefore, the matter is equally simple. Why, then, all the trouble that is being raised about the subject since the recent rulings in the Divorce Courts, involving questions of venereal disease and still-birth notification respectively—rulings which were very definitely given by the judges concerned, and rulings which could hardly have been otherwise without causing or risking a travesty of justice? The presiding judge is the only person who can decide as to whether or not the information or evidence (however private and confidential) is necessary for the Court to have, and with that learned gentleman the matter must be left in all cases, with the proviso of the medical evidence being given privately. It seems almost ludicrous for a medical practitioner to protest and to claim, under such circumstances, absolute or partial privilege. Privilege for what? Privilege to deceive, or mislead, the Court? Such an idea is contrary to strict justice.

With varying views on the subject in Britain, it is only to be expected that similar variations will be found in other countries, and even in different British Dominions. One prominent fact, however, stands out, viz., that nowhere is it laid down that a Court shall be excluded from going behind a medical privilege.

Finally, the question of privilege as applied to, e.g., the legal and the Roman Catholic clerical professions, are not comparable with that applied to the medical profession—the last-named being concerned with matters of fact and not with *ex parte* statements.

## PROLAPSE OF RECTUM. (*See* Rectum.)

## PROSTATE, SURGERY OF.

*Sir John Thomson-Walker, F.R.C.S.*

### Prostatitis.

Pelouze,[1] in an article on the rôle of the prostate in focal infections, states that it is wrong to regard prostatitis as essentially a post-gonorrhœal condition, though it is true that most cases are post-gonorrhœal. A small number of cases of non-gonorrhœal prostatitis give no relevant history of a previous infection; but the majority have had an infectious disease, such as pneumonia, typhoid, or influenza, one or more attacks of tonsillitis, or some dental infection to which the prostate infection seems secondary. Diagnosis of infection and pronouncement of cure can only be made by the microscopic examination of fluid expressed from the prostate by **Massage,** for leucocytes and bacteria. The fresh secretion of the normal prostate shows from 2 to 6 leucocytes to the $\frac{1}{6}$ in. field. Gonococci can very rarely be demonstrated in chronic cases unless there has been exacerbation of the disease, though at times, when one has been unable to find it in the prostatic fluid, the patient will develop an anterior urethral discharge about forty-eight hours later, showing that the urethra has demonstrated what the microscope was unable to reveal. Such recrudescences generally soon subside, but are apt to recur from time to time during a course of treatment, and their occurrence is useful in that it reveals a dormant gonorrhœal focus, the commonest cause of the perpetuation of gonorrhœa. Bacteria most often found are staphylococci, pneumococci, diphtheroid bacilli (Hoffman type), colon bacilli, and streptococci. The last is seldom found as a post-gonorrhœal secondary infection, being more common after tonsillar and dental infection.

The pain and temperature, analogous to a vaccine reaction, rarely last more than twelve to twenty-four hours, after which there is marked improvement for some days, and after each subsequent massage less and less discomfort is felt. This treatment continues every three or four days until the secretion is free from pus. An **Autogenous Vaccine** is a valuable adjunct to this treatment in many cases. Not uncommonly prostatic cases become stationary as regards the local symptoms and the amount of pus in the urine, and cysto-urethroscopy will reveal 'lympho-cystic' bodies. If these are present, a careful search should be made for a mildly active tuberculous focus, prostatic massage be stopped, and the patient put on an antituberculous régime. [It is better to search carefully for evidence of tubercle before commencing the prostatic massage, and to avoid this treatment in any doubtful case.—J. T.-W.]

Player and Mathe[2] have made a study of tumours of the vesical neck and the prostatic urethra, and their relation to the treatment of chronic prostatitis, and consider that many cases of persistent and recurrent prostatitis, and vesiculitis, are due to inflammatory tumours of the posterior urethra, of which they analyse 68 cases in this article. Pain and discomfort in the perineum, constant and repeated morning drop, backache, and itching within or at the meatus, were the most common symptoms in order of frequency. Cysto-urethroscopy was necessary for diagnosis for all cases, after infection of the upper urinary tract had been ruled out. They suggest that these tumours may be retention cysts of some of the many glands of the posterior urethra and cervical neck. Three types may be observed: (1, 2) True pedunculated polypi, and sessile polypoid masses (both histologically either fibrous or glandular); (3) Œdematous excrescences. They believe that all these tumours begin as œdematous excrescences, later become of the polypoid mass type, and finally become pedunculated polypi.

The various methods of treatment are: (1) **Urethral Dilatation** with sounds and posterior dilators, which gives the best results in the third type of case; (2) Topical application of **Caustics,** such as silver nitrate and strong acids; (3) **Snaring** through the urethroscope or cystoscope; (4) **Excision** by means of scissors; (5) **Crushing the Pedicle** by rongeur forceps; (6) Destruction by means of the **Actual Cautery**; (7) **Fulguration,** which gave the best results in most cases. After destruction of the tumour, local treatment of the prostate and vesicles is delayed for one month. Improvement was marked in 73 per cent, slight in 20 per cent, and absent in about 6 per cent.

### Prostatic Obstruction.

In an article on the various types of prostatic obstruction, based on a series of 800 cases which came to autopsy, Randall[3] states that, generally speaking, only three different types of pathological change are found: glandular hyperplasia, fibrosis, and neoplasm.

Four types of obstruction were recognized: (1) That due to generalized prostatic hypertrophy; (2) That due to median lobe hypertrophy; (3) Cases of median bar obstruction; (4) Cases of malignant growth. Belonging to the first group of obstructions were 29 cases of simple lateral lobe hypertrophy, and 22 cases of trilobar hypertrophy. Hypertrophy of the middle lobe alone was found in 42 cases. The third type of obstruction, that due to median bar formation, in which the obstruction cannot be accounted for by lateral or middle lobe hypertrophy of the prostate, is found in two forms, the fibrotic and the hypertrophic, which can be differentiated cystoscopically.

In the first form the fibrous bar should be destroyed by **Fulguration,** by a **Punch Operation,** by open **Dissection,** or open **Cauterization.** In the type due to hypertrophy of gland tissue, if this is in the subcervical glands, and is discrete, partially pedunculated, superficial, and not too large, the **Punch Operation** should remove all of it. When it is in the posterior prostatic commissure, deep seated and broad based, open operation is essential, complete **Enucleation** or **Destruction by Cautery** being called for.

Deaver and Herman[4] discuss the prognosis in prostatectomy, and state that the two-stage operation is a decided advance in the treatment of selected cases, but question the advisability of its adoption as a routine procedure. They give the indications for it as: (1) Cases of acute retention due to hypertrophy of the prostate, uncomplicated by urethral stricture; (2) Most cases with large quantities of residual urine; (3) All cases with severe infection of the bladder; (4) The small group of cases in which drainage is necessary owing to bleeding from the prostate. They think preliminary cystotomy a life-saving measure, not only in cases in which palliative treatment is urgently needed, and the catheter is tolerated badly, but also in many cases in which a catheter has been used with apparent success in the past, because it is the most efficient means of relieving back-pressure on the kidney and limiting the spread of infection. They find, after it has been performed, that hæmorrhage following prostatectomy is less and convalescence more rapid.

The primary mortality after perineal prostatectomy is slightly less than that after the suprapubic operation, and this mortality depends more on the selection and pre-operative treatment of cases than on the type of operation. In this series the death-rate was 10·9 per cent after the perineal, and 6·9 per cent after the suprapubic operation. The chief causes of death immediately after operation, in the cases reviewed, were: uræmia 39, hæmorrhage 32, shock 18, sepsis 13, cardiovascular disease 10, pyelitis and pyonephrosis 8, pulmonary complications 6, asthenia 7, embolism 5. The late results of 372 perineal and 814 suprapubic prostatectomies are as follow: 70 per cent of the cases after the perineal operation were completely cured, and 78 per cent were alive and free from bladder symptoms two years after the operation. After the suprapubic operation, 76 per cent were completely cured, and 79·4 per cent were alive and free from bladder symptoms two years after operation. Whatever the figures, in estimating the prognosis of any given case of prostatic hypertrophy, the physical condition of the patient is the important factor.

Hutchinson[5] mentions some unusual clinical pictures presented by prostatic enlargement. Some cases with much impaired renal efficiency, resulting from prolonged back-pressure, as chronic uræmia sets in, develop gastro-intestinal symptoms. Loss of appetite, nausea or vomiting, with wasting and sometimes also with epigastric pain, in an elderly man, suggest carcinoma of the stomach. At times the mere mechanical hindrance to the passage of urine, apart from any question of uræmia, appears to give rise to abdominal pain and vomiting. That the symptoms in such cases cannot be due to mere uræmia is shown by the fact that they are immediately relieved by emptying the bladder. When renal efficiency is much impaired, polyuria and thirst become prominent features, and these symptoms may set in quite suddenly, suggesting at first that the patient has developed diabetes. Such cases should be kept in bed, given **Hexamine**, and abundance of bland fluids, and the bladder emptied very gradually, operation being considered only after improvement in the patient's condition. In all cases of constipation in old men, the possibility of prostatic enlargement should be borne in mind. The large gland acts in part mechanically, and in part probably by interfering with the normal co-ordinated movements of peristalsis. The resulting delay causes the rectal contents to become very dry, and therefore evacuation is difficult. There is often a feeling of distention of the upper rectum, and such cases frequently suffer from irregularity of the heart and palpitation.

Thomson-Walker,[6] in a paper on **Open Prostatectomy** read before the Urological Section of the British Medical Association, points out that suprapubic prostatectomy as practised to-day is a blind operation, and advocates a modification of the technique, with the object of eliminating as far as possible the post-operative sequelæ—hæmorrhage, infection, and obstruction—not infrequently found after simple enucleation. Hæmorrhage has a considerable influence, partly direct, partly indirect, on the mortality. Deaths as a direct result of hæmorrhage he has found to be rare; but a large number of the deaths ascribed to shock, collapse, and asthenia are due to hæmorrhage. In addition there are deaths attributed to renal failure, bronchitis, bowel complication, and other conditions where hæmorrhage is a contributing or a deciding factor in the fatal result. Sepsis is sometimes found to persist in spite of careful post-operative treatment; sloughs, impregnated with phosphates, may be formed; epididymitis, pyelitis, venous thrombosis, and pulmonary embolism may occur during convalescence; secondary calculus occasionally forms in the bladder or prostatic cavity. These results of persistent infection he considers to be due, in most cases, to the sloughing of strips, tags of mucosa, and partly to detached portions of capsule. Obstruction after prostatectomy occurs most commonly at the site of the internal meatus. Here folds and strips of mucosa frequently remain after enucleation, and posteriorly a semilunar fold formed of the trigone muscle and mucosa over it is constantly found. Obstruction at the apex of the prostatic cavity is much less frequent, occurring in only two out of sixteen cases.

At the open operation the bladder and prostatic cavity are cleared of clot, and strips and folds of mucus cut away. The posterior fold is gripped by long pressure forceps, placed on it at an angle so as to include a wedge-shaped portion, which is then removed with scissors. The interior of the prostatic cavity is now fully exposed, a large oval opening joining the bladder to the prostatic cavity effectually preventing any danger of stricture-formation at this point. Within the prostatic cavity, loose strips or folds of partially detached capsules, or flattened nodules of prostatic tissue, or occasionally a long strip of urethra, are found, and must be removed.

Control of hæmorrhage in this operation is usually complete and accurate. The main bleeding points usually are found on either side, in the muscle or just under the torn mucosa of the thick lip of the vesico-prostatic opening. These are caught by pressure forceps and tied off, or the whole lip is sutured with a continuous catgut stitch. Bleeding from the wall of the cavity is usually venous and not important. It may be difficult to control with pressure forceps, but is generally controlled by temporary packing. Should this not suffice, the catheter is drawn somewhat into the bladder, and iodoform gauze is firmly packed around the instrument, so as to plug the prostatic cavity.

Bugbee,[7] in a paper on prostatectomy in bad surgical risks, urges the importance of not emptying the bladder too rapidly in cases presenting partial or complete retention. With a markedly distended bladder, as long as two weeks have been allowed to elapse before completely emptying it. If the patient can be put to bed at once, a catheter is tied in and retained until the patient shows no signs of uræmia. Suprapubic drainage may then be established without undue risk. Even after catheter drainage this step will often result in a decided return of uræmic symptoms, showing that suprapubic drainage is more complete than that by catheter. Patients with incomplete retention, or those who have been accustomed to catheterization, may usually be drained at once suprapubically, and this can be done by the careful introduction of a de Pezzer self-retaining catheter in such a way that the bladder can be emptied a little at a time in exactly the same manner as by urethral catheter.

Important adjuncts to this treatment are the giving of large quantities of bland fluid by mouth and per rectum, with great attention to the bowels, and having the patient up and out of bed as much as possible. Renal function tests are important during the stage following on the establishment of free drainage, and when these, together with the clinical picture, are found to be satisfactory, the removal of the prostate can be considered.

Rosencrantz,[8] writing of the post-operative treatment of prostatectomy cases, states that post-operative hiccough is a potentially serious condition which should be checked promptly before the pernicious stage is reached. The most probable cause, he thinks, is pyelonephritis, which produces a reflex or a toxæmia, usually without uræmia. For treatment he prohibits all medicine and food by mouth, washes the stomach out two or three times daily with 0·5 per cent sodium bicarbonate solution, applies hot compresses to the loins, and administers 2000 to 3000 c.c. of a 0·5 solution of sodium bicarbonate with equal parts of a 5 per cent solution of glucose during each twenty-four hours, preferably by the rectal drip method ; finally, he gives 5 gr. of chloretone and 5 injections of atropine ($\frac{1}{100}$ gr.) at two-hourly intervals. Diarrhœa he finds can only be checked with laudanum ; bismuth has no effect. The causes of post-operative rise in temperature are constipation, infection in the prevesical space, pyelonephritis, and a flaring up of some old focus of infection. He prefers spinal anæsthesia because it lessens the danger of hæmorrhage and uræmia, gives the most complete relaxation, does not irritate the kidneys, and prevents ether pneumonia.

The complications of prostatectomy are considered by Hunt,[9] who states that in the Mayo Clinic carcinoma of the prostate is usually not treated surgically; thus his remarks apply mainly to the treatment of benign cases. Pre-operative recognition and treatment of actual or potential uræmia are responsible for the present infrequency of post-operative uræmia. Two or more ounces of residual urine should indicate preliminary catheter drainage of the bladder. Operative and post-operative complications of prostatectomy have been minimized by the suprapubic open operation, which enables diverticular calculi and hæmorrhage from the capsules or at the neck of the bladder to be dealt with. Post-operative pulmonary complications are uncommon, largely because of the short time during which the patient is kept in bed. Pulmonary embolism rarely causes death. Post-operative uræmia develops only in cases in which prolonged back-pressure in the kidneys and severe infection have caused so much renal damage that bladder drainage is of no avail. Secondary hæmorrhage occurs occasionally and is profuse. He states that this can usually be controlled by removing all catheters and avoiding vesical irrigation. Epididymitis is more common after urethral catheter drainage of the bladder, but can be lessened materially by rigid asepsis. A persistent suprapubic sinus is usually due to incomplete removal of the prostate, a transverse bar at the vesical neck, stricture of the prostatic urethra, a large diverticulum, or non-absorbable suture material. General sepsis occurs occasionally after operation in the presence of marked local infection. The most common source of this complication, however, is probably the indiscriminate post-operative use of the urethral catheter in attempting to close the suprapubic fistula, as a result of which empyema, suppuration, arthritis, meningitis, etc., may develop.

Marsan[10] considers one of the advantages of two-stage prostatectomy to be the reduction of the routes for absorption of infection owing to the granulation of the sides of the suprapubic wound before the prostate is enucleated. He advises a very small incision one finger-breadth above the pubis. In 132 cases quoted, the interval between cystotomy and prostatectomy was two to four weeks in 10, one to three months in 43, and up to two years in the remainder. The mortality in this series was 7·57 per cent, whereas in 168 prostatectomies done at one sitting it was 16·07 per cent. Before the second stage time must be allowed for the condition of the urine to improve, for the azotæmia and Ambard index to decline, and for the patient to regain good health.

Rubritius[11] states that two-stage prostatectomy has greatly increased the scope of the operative treatment of prostatic enlargement; many cases which were hitherto regarded as inoperable can be cured by this means. Drainage allows of the treatment of existing infection, and relieves the kidney of back-pressure; at the same time, by removing the difficulties of micturition, it enables the patient to sleep, and regain his general health. He finds that certain patients find the relief given by cystotomy to be such that they decline further intervention.

Fischer[12] recommends the following procedure for achieving hæmostasis in suprapubic prostatectomy. The prostate having been removed, and the edges of the torn mucosa around the prostatic cavity caught with forceps to keep them apart, a tampon, fitting the prostatic cavity tightly, is secured by a stout silk ligature and introduced into the cavity, which has been carefully cleared of clots. The margins of the torn vesical mucosa are sutured with strong catgut over the tampon, anterior margin to posterior margin, the silk thread holding this being let out between two sutures, and on through the bladder to the suprapubic wound. The prostatic cavity is thus completely shut off from the interior of the bladder. A drainage tube is fixed in the bladder without touching the bladder wall, and the bladder and abdominal wall are tightly closed around it, a small cigarette drain having been placed in the prevesical space.

In the last 200 cases in which Chute[13] performed prostatectomy he found 35 (17·5 per cent) to be malignant. This finding he thinks probably underestimated the relative frequency of cancer of the prostate, some of the early cases showing little that is suggestive of the condition, especially when the disease is associated with hypertrophy. He finds that there is great divergence of opinion concerning the indications for operation in these cases, and also little agreement as to what sort of an operation to carry out when one is indicated. The clinical symptoms are grouped as follows: (1) Obstruction to urination; (2) Pain due to pressure; (3) Vague urinary symptoms, especially in relatively young men. In cases of the first type he believes it is best to remove as much of the prostate as possible, for while we cannot hope to cure, we can in many cases give a degree of palliation that is well worth while, and in fact actually lengthens life, in that a very considerable portion of unoperated cases of this type die from the pyelonephritis seen in other instances of urinary obstruction. The second group of cases offers indications for operation that are less clear. In some, however, the removal of such malignant tissue as is possible is followed by an amelioration of the pain, and operation is justifiable, especially if radium is implanted in the walls of the cavity as well. No operation would be indicated in cases in which it seemed probable that pain in the legs was the result of a metastatic involvement of the spine. In the third group of cases, in which a feeling of discomfort is complained of, such as is occasionally found with chronic prostatitis, the indication for treatment is far from clear. In general, the course of the disease is fatal, though it may often be slow, and removal of the tissue may be followed by a long respite, especially with the use of radium, which is greatly facilitated by operation. His own experience with this type of case is that they have not done well after operation, but gone on rapidly to a fatal termination.

In the removal of the malignant prostate he has found three procedures useful: (1) Suprapubic removal if possible by enucleation: only possible in the less advanced cases. (2) Preliminary suprapubic drainage followed by perineal removal of the growth. The presence of a cystotomy facilitates the perineal removal, especially if the prostatic punch is used. (3) Removal by a modification of Young's perineal operation for the adenomatous prostate, the incision into the prostate being transverse instead of antero-posterior. This method he uses for the majority of his cases. The results in this series were as follows: One patient, age 80, died as the result of operation. Four died in from six weeks to six months after operation, and were failures as regards real relief of symptoms. One died two years after the operation as the result of an accident; multiple metastases were found at autopsy. One died some months after operation, cause not known. One died two and a half years after operation, having continued at his work until three weeks previously. Four were lost sight of; these probably have died. Three died of intercurrent disease, two of these being known to have remained free of urinary symptoms. One died of a recurrence nine months after operation. One was well a few weeks ago, three years after operation. Three operated on two years ago are comfortable, but one done at the same time has recurrence. One operated on over a year ago is well. Of thirteen operated on within a year, five are comfortable, one has recurrence locally, one has had a recent pathological fracture of the femur. The remaining six have been operated on too recently for any conclusions to be drawn.

Judd, Bumpus, and Scholl,[14] in a paper on the "Prognosis in Cases of Carcinoma of the Prostate", state that this disease is met with surgically in three types: (1) With carcinomatous changes which, although definite, are thought to be sufficiently early to warrant attempt at removal; (2) Suspected carcinomata which cannot be diagnosed positively; (3) The type discovered at operation. It would be assumed that the prognosis in Type 3 is best, whereas that in Type 1 is worst.

Sixty-six of the 77 patients in whom cancer was either diagnosed or suspected have been traced. Of these, only 8 (12 per cent) have lived more than three years, a result indicating that, if the disease has progressed sufficiently to be recognized clinically, surgery offers no better results than radium.

Of 62 patients in whom malignancy was so obscure as to escape clinical detection, and was discovered only at operation or after careful microscopic examination later, 51 have been followed up, and of these 8 (15 per cent) lived more than three years.

Clinically, there are two main types of prostatic carcinoma. In the first type the prostate is large, nodular, and stony, and obstruction is the first evidence of its presence. This type is the more common and the less malignant of the two. The second type may be confused with chronic prostatitis. The malignant cells that have migrated into the stroma often show a streaked appearance, in contrast to the clumped localized deposits of small round cells. In 100 of the 146 cases of this series, microscopical examination was correlated with the post-operative course. Of the first type there were 44; 11 of these lived more than three years; 22 are still alive, 1 after six years, 2 after five years, 4 after four years, 3 after three years, 6 after two years, and 6 after one year. Of the second type there were 56 cases; of these, 16 lived two years, 7 lived three years, and only 1 lived more than three years. There are still alive 3, 1 three years and 2 one year after operation. The authors consider therefore that the degree of malignancy, as demonstrated microscopically, determines the prognosis, and that when the disease has advanced sufficiently to be recognized clinically the possibility of surgical cure is much diminished.

REFERENCES.—[1]*Med. Record*, 1921, Sept. 3, 412; [2]*Surg. Gynecol. and Obst.* 1921, Aug., 153; [3]*Ibid.* Oct., 333; [4]*Ibid.* July, 70; [5]*Practitioner*, 1921, Dec., 394; [6]*Brit. Med. Jour.* 1921, ii, 311; [7]*Jour. Amer, Med. Assoc.* 1921, Sept. 17, 905; [8]*California State Jour. Med.* 1921, xix, 107; [9]*Surg. Gynecol. and Obst*, 1921, Dec., 500; [10]*Paris méd.* 1921, Aug. 6, 32; [11]*Zeits. f. urol. Chir.* 1921, July 26, 109; [12]*Ann. of Surg.* 1921, Dec., 768; [13]*Boston Med. and Surg. Jour.* 1921, Oct. 27, 500; [14]*Surg. Gynecol. and Obst.* 1922, March, 245.

## PRURITUS.

*E. Graham Little, M.D., F.R.C.P.*

Pulay[1] classifies the associations of general pruritus in five groups. The first is a neurotic pruritus, with 'predominance of the vagotonic element'. For this group small doses of **Atropine** are recommended. The second class includes all cases of abnormal uric-acid metabolism, with which are classed leukæmia and lymphogranulomatosis cases. Treatment is on the same lines as for gout. The third group is diabetic, and internal administration of **Salicin** is recommended. The fourth group is associated with chronic uræmia; **Venesection** and diet as for nephritis are indicated. The fifth group comprises cases with high uric acid, cholesterin, and sugar-content in the blood, but with normal urine secretion.

*The Psychological Factor in Pruritus and Prurigo.*—Sack[2] has an interesting paper on this subject, and does well, in these days of insistence on the septic factor in skin disease, to draw attention to the psychological factor, which is too often overlooked. He divides his subject into three classes: (1) Psychological pruritus without skin changes; (2) Psychological pruritus with skin changes; (3) Pruriginous dermatoses with psychologically increased irritation. As an example of the first type he quotes a case of a girl who had been raped with violence, and who later became affianced to another man than her aggressor. She decided to tell her future husband before marriage was solemnized what had happened to her, and under the dread of the avowal became a prey to a nervous pruritus without physical signs, which baffled all treatment. The author states that after 'two hypnotic sittings' she was completely cured; but some at least of the curative effect must be attributed to her decision at the same time to say nothing to her fiancé of her rape. As an example of the second type this story is told. A maidservant came to the author with 'névrodermite' of the flexures of the elbow, neck, and waist. She showed in addition a marked psychasthenia (Janet). She was treated six times with hypnosis, at two-day intervals, and the névrodermite vanished, leaving no trace, nor has there been recurrence. The description given of the skin condition leaves little doubt that the diagnosis of névrodermite was correct, and this response is truly remarkable. As an example of the third group a case is mentioned of a woman of 40, with a positive Wassermann reaction, and an eruption "quite typically lichen planus". The itching was agonizing, and the author notes, as a point of interest, that the frenzied attacks of itching were transmuted occasionally into the sexual orgasm. No measures of relief were achieved until the author gave her three sittings of hypnosis, and although there was one relapse, he claims that she remained cured on repetition of this treatment. The author states his conviction that every doctor should learn how to give hypnosis.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1922, Feb. 4, 395; [2]*Münch. med. Woch.* 1922, Feb. 3, 148.

## PSEUDOCOXALGIA. (*See* BONES AND JOINTS, SURGERY OF.)

## PSEUDOXANTHOMA ELASTICUM.

*E. Graham Little, M.D., F.R.C.P.*

Throne and Goodman[1] add another to the extremely meagre list of examples of this rarest of diseases, and they summarize the hitherto recorded cases, which number only twenty-one. The eruption consists of round or oval smooth shiny papules from the size of a pinhead to that of a pea. The colour may be a light-yellowish mixed with violet, or brown, or colourless; the papules may be isolated or grouped or confluent in plaques or lines (*Plate XXXIV*). Clinically the discoloration is often meshlike. The sites of election are the axillæ, groins, bend of elbows, neck, hands, and—rarely—face. The eruption undergoes little or no change, and subjective symptoms are slight.

The patient here described was a woman of 39, in whom the change of colour had been noted as early as the age of four years. The skin of the entire circumference of the neck was affected. This patient had a sister who had a similar discoloration noted also at the age of four years. She died in adult life of tuberculosis. The disease in the present patient extended to involve the clavicular regions, the suprasternal notch, the axillæ, and elbows. Microscopical sections showed the breaking up of elastic fibres in the dermis, and their degeneration was demonstrated by staining tests, which are characteristic of the histology of this disease.

REFERENCE.—[1]*Arch. of Dermatol. and Syph.* 1921, Oct., 420.

## PSORIASIS.

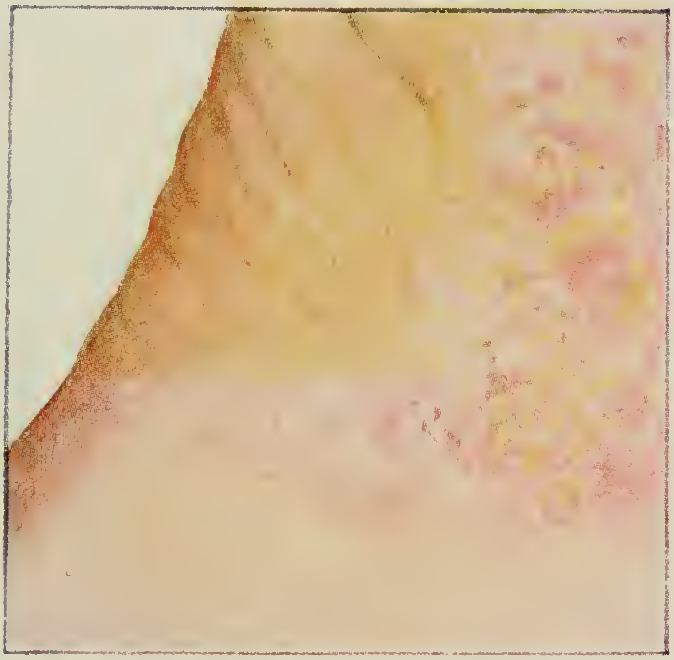
*E. Graham Little, M.D., F.R.C.P.*

Jamieson,[1] impressed by the researches of Schamberg and his associates, which seemed to show that psoriasis was connected with protein intake, has experimented with a series of ambulatory dispensary negro patients, determining the nitrogen content of the blood in forty-five cases. The conclusions are that the author is unable to state that the increase or decrease of lesions

# PLATE XXXIV.

## PSEUDOXANTHOMA ELASTICUM

(THRONE AND GOODMAN)



Pseudoxanthoma elasticum (slightly enlarged), showing the individual lesions and part of one raised plaque from side of neck. *(Illustration by Alfred Feinberg.)*

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*'Archives of Dermatology and Syphilology'*

corresponds with an increase or decrease of either total non-coagulable nitrogen or uric acid. He is, nevertheless, convinced that psoriasis is due to faulty metabolism; but his research shows that nitrogen is not retained in the blood.

Griffin,[2] wishing to test the usual warning to avoid **Arsenic** in acute phases of psoriasis, tried it on a patient with very congestive patches, the dose given being 5 min. of liq. arsenicalis ter die. The eruption had almost wholly disappeared within six weeks of beginning this treatment, which was combined with local applications of sulphur and salicylic acid.

Kilroy[3] recommends an alcoholic solution of 5 to 15 per cent each of **Lactic Acid, Acetic Acid, Salicylic Acid,** and **Formaldehyde,** with a 'weak' percentage of mercuric chloride.

Sutton[4] recommends a combined **Vaccine** treatment and strong **Chrysarobin** ointment. The vaccine is used as a foreign protein, and the actual form used by the author was an autogenous vaccine of *Bacillus coli*; 20 per cent chrysarobin ointment is vigorously rubbed into the patches as well, twice daily, the patient being kept in bed for an average period of seven days! The eyes are bandaged at night to prevent contact with chrysarobin. The dose of vaccine is given in increasing quantity until a reaction is obtained, indicated by rise of temperature. If subcutaneous injection does not succeed in doing this, the intravenous route is tried.

REFERENCES.—[1]*Arch. of Dermatol. and Syph.* 1921, 627; [2]*Brit. Med. Jour.* 1921, ii, 41; [3]*Arch. of Dermatol. and Syph.* 1921, Nov., 636; [4]*Ibid.* 634.

## PSOROSPERMOSIS. (*See* DARIER'S DISEASE.)

## PSYCHOLOGICAL MEDICINE. (*See also* MENTAL DISEASE.)

*J. A. Hadfield, M.A., M.B., Ch.B.*

### PSYCHOLOGY AND THE UNCONSCIOUS.

A discussion on the subject "Is the conception of the unconscious of value in psychology?"[1] amplifies the discussion of a few years ago by the Psychological Society on "Why is the unconscious unconscious?" [The subject was also discussed in the MEDICAL ANNUAL last year.] The positive and negative replies were given by F. Aveling and E. C. Field respectively. Their arguments may be briefly summarized as follows:—

E. C. Field gives a negative reply. All that we know of ourselves are bodily processes and our own conscious mental processes. It appears that there are many activities whose origin is in neither of these. They must be derived from an unknown source, to which is given the name of the unconscious; but we know nothing of it except that it is unknown. To assume, because following a certain event there results a certain reaction, that therefore the original event lives as such in the mind, goes beyond our facts. We do not assume that, because a physical event produces a present physical result, the original event must always be present. An event, whether in the physical world or in conscious experience, when it has once happened, is over and finished.

Criticizing Dr. Ernest Jones,[2] who says that unconscious mental processes present all the attributes of conscious ones, except that the subject is not aware of them, and that consciousness thus becomes merely one attribute of mentality, and not an indispensable one, Field remarks, "I have searched in vain for a clear statement of what the *other* attributes of mentality are which these processes do possess".

Aveling upholds the conception of the unconscious. If we accept the idea that certain things are in the focus of attention and other things in the fringe, there being a gradual lessening of conscious attention as we get nearer the fringe, it is natural to assume that, as we pass further, there are some processes that are not at all in conscious attention; and further, as we find some events are much more difficult to recover into memory than others, so we may assume that there are some which are impossible of recovery to the patient, except by special processes. A more important argument is this: the origin of many mental factors is unknown; but since the unknown produces the same kind of effect as the conscious mental processes do, we are justified in assuming that, as their effects are similar, so must they be in nature. Again, in every conscious complex we find the three elements of cognitive, conative, and affective. But these may be in very different proportions; e.g., in a conative expression, such as an act of will, there appears to be little cognitive or even affective; and whereas theoretically the cognitive may be there, in fact it is so slight as not to be recognized. So an act of will, consciously made but not fulfilled, will later manifest itself apart from recognized consciousness.

T. W. Mitchell,[3] in a very concise but lucid chapter on the unconscious, discusses the various modes of explaining unconscious mental processes, from the physiological view, through the conception of the subconscious, the co-conscious of Morton Prince, the subliminal of F. W. Myers, and 'dissociation' of Janet, to the more recent views of Freud and Jung. He contrasts the preconscious and the unconscious of Freud with the personal and collective unconscious of Jung. "Repression of the collective is a reaction of the individual against the encroachments of the social consciousness: repression of the impulses is due to a reaction of the social consciousness against the egocentric tendencies of the individual." Mitchell suggests a compromise between these two practically incompatible views: "The true unconscious of Freud would seem to correspond in many respects to the impersonal or collective unconscious of Jung, for the primitive impulses which form the core of the Freudian unconscious must be deemed to have universal validity, since they are common to all mankind."

## COMPLEXES AND SENTIMENTS.

A symposium upon the relation of complexes and sentiments was held at Manchester in July, 1922.[4] In a sense the definition of these terms will help to define the relation between abnormal psychology, to which the term complex belongs, and academic psychology, in which the term sentiment is used.

Tansley points out that Jung originally used the term 'complex' in a general way to include both normal and abnormal mental processes. It is a 'complex of presentations' carrying a specific affect. Jung did not at first use it exclusively of *repressed* complexes (but speaks, for instance, of an 'ego complex'), though later he came to use the term almost exclusively in that sense. Tansley himself defines complex as a "system of associated mental elements, the stimulation of any one of which tends to call the rest into consciousness through the medium of their common affect". Bernard Hart[5] originally used the term in the broad sense as an "emotionally-toned system of ideas", including normal as well as abnormal conditions, but now regards this as too wide a definition. McDougall[6] was the first to suggest that 'sentiment' should be used of normal, and 'complex' of abnormal processes.

Rivers suggests that "we give to the terms complex and sentiment their greatest value in psychology and psychopathology if we make *suppression* the key-note of the complex, while *fusion* (with the other mental contents of the mind) is the essence of the process upon which depends the formation of a sentiment". Other features of the complex are its affective importance, its incapability of modification, and the fact that it is an unnecessary feature of normal mental life.

Shand emphasizes the *autonomy* of the complex, its compulsive and involuntary nature. He objects to the 'complex' being defined as 'repressed' or 'dissociated', because these terms are as ambiguous as that which they are supposed to explain. Since a sentiment is a system of several emotional dispositions, having different conative tendencies, connected with a common object and subordinated to a common end, "I prefer the term 'system' to the term 'complex' where we are dealing with the normal mind".

Pear says: "The important aspect in which the complex and sentiment appear to differ is this: that while the sentiment is an organized system of emotional tendencies grouped about the object, the complex seems to be a relatively unorganized collocation, sometimes almost a fortuitous concourse, of such tendencies collected about an object."

Myers distinguishes between a sentiment (1) as involving an actual experience—the sentiment feeling, (2) as in the sense in which one may, in the presence or absence of the object, be said to love or hate him without actually experiencing the sentiment feeling. A complex, the essence of which is that it is founded on surprise, irrationality, and inexplicability, is ultimately a cognitive experience which has become dissociated, repressed, suppressed from, or inhibited by, the normal personality. It is not necessarily morbid, nor is a sentiment necessarily healthy.

The present writer,[7] in a paper read before the British Medical Association, made 'acceptability' to the self the distinguishing feature: "The sentiments are those constellations of emotions ranged round an idea, object, or person which are consciously acceptable to us, like patriotism. The complexes, because of their repugnant or painful nature, are rejected by the self as unacceptable. Such complexes may be recognized or unrecognized. The memory of a humiliation may be a conscious 'complex', whereas the complex may be successfully forgotten, in which case it is a dissociated or 'repressed complex'. The mental conditions we accept are our sentiments: the things we reject, consciously or unconsciously, are our complexes."

## PSYCHONEUROSES AND THE ENDOCRINES.

"Endocrine glands, being influenced by toxic functional and psychic factors, may alike cause or be affected by a psychoneurosis" (Langdon Brown[8]) (*see* MEDICAL ANNUAL, 1922, page 122: ENDOCRINOLOGY). "Between the vegetative and psychical systems a vicious circle is established, and each harmful stimulus in the one influences the other" (Pottinger). The interaction between psychical states and the endocrine secretions suggested in these quotations was further developed in a suggestive paper by Crichton Miller,[9] who maintains that different types of character correspond to different 'endocrine patterns'. The influence of the endocrines on character is aptly illustrated by castration in horses, which transforms the high-spiritedness of the stallion into a tame docility. The importance of an attack of mumps with even a mild orchitis is thus pointed out. The thyroid gland is the gland of *creation*, maternal or artistic: the pituitary, the *ideal* power urge, typified in Napoleon, Bottomley, and Northcliffe; adrenals are the glands of the *real* power urge, typified in the naval officer. Crichton Miller, however, avoids the pitfall of the medical myopic who concludes that because certain conditions, whether endocrine or anal-erotic, influence character, they necessarily 'cause' it. "The endocrine balance in man may condition, but it does not determine, behaviour." The influence of the several factors, physiological and psychological, has long been recognized in the case of Graves' disease, and the list of diseases which come under a similar category seems to be increasing, and appears to include asthma, migraine, epilepsy, and Ménière's disease.

But because we recognize that in many cases of neurosis both physical and mental factors play a part, because, in other words, we cannot 'rule out' the physical factor in the psychoneuroses, it must not be assumed that we cannot distinguish them. Indeed, we cannot understand them until we do distinguish them. Ultimately we must be able clearly to distinguish the influence of each separate factor, and shall be able to say of any special 'neurotic', so much is due to constitutional deficiency of the cortex, so much to endocrine deficiency, so much to temporary causes such as fatigue, so much to predisposing psychogenic factors originating in childhood, and so much to the present-day influences of his psychological environment. It is only our present ignorance that prevents our so distinguishing them. It is surely time to stop insisting that 'both factors always play a part', and find out how great a part each plays. It is here that the extremist is valuable. It is not so much an 'all-round' view that is required, as an accurate knowledge of the extent and limits of each of the factors. It is possible to be so 'balanced' in one's view that one fails to cure the patient, whilst the extremist, whether physiologist or psychologist, may carry off the therapeutic palm. (*See also* MENTAL DISEASE.)

## 'SHELL-SHOCK': THE WAR OFFICE INQUIRY.

This inquiry was specially instituted to record for future use of the War Office the ascertained facts as to the origin, nature, and remedial treatment of the different types of hysteria and traumatic neuroses commonly called 'shell-shock'. Originally considered to be the immediate result of concussion caused by close proximity to a violent explosion (General Horne), its more psychological character was later emphasized, as in Dr. Stanford Read's definition, "A mental abnormality brought about by emotional shock, of which a shell explosion is only a frequent type"; or in the intermediate view given by Dr. A. F. Hurst, "Concussion of the brain and spinal cord result in structural changes which are, for the most part, evanescent, so that the symptoms they produce are only temporary, but they may be perpetuated as hysterical symptoms owing to suggestive 'influence'".

Three forms of 'shell-shock' are distinguished: (1) Genuine concussion without visible wound as a result of shell explosion—commotional disturbance. The cases in this class were relatively few. (2) Emotional shock, either acute in men with a neuropathic predisposition, or developing slowly as a result of prolonged strain and terrifying experience, which form about 80 per cent of all cases. In the large majority of persons showing emotional shell-shock there was present in the family history, as in the personal history, evidence of weakness, instability, or defect of the nervous system; but witnesses agreed that any type of individual might suffer from one or other form of neurosis if exposed for a sufficient length of time to the conditions of modern warfare, and that no human being, however constituted, however free from inherent weakness, can resist the direct effect of the bursting of high-explosive shells. (This opinion, of course, runs counter to the generally accepted view that 'all neuroses date back to childhood'). (3) Nervous and mental exhaustion, leading to mental disorders.

*Methods of Treatment.*—The inquiry states emphatically that the original methods employed, namely, disciplinary measures under executive army officers, and medical treatment of these conditions as organic nervous diseases, were inadequate, and resulted in an accumulation of unprogressing cases of shell-shock in the military hospitals. Between the specific psychological methods of treatment—persuasion, explanation, suggestion, analysis, and re-education—no choice is made, owing probably to the difficulty in getting reliable statistics of results of treatment; but all are recommended. "A full analysis in the Freudian sense (psycho-analysis) was recommended by very few witnesses". This, of course, would easily be accounted for by the selection of witnesses, and as it stands might mean very little. Nevertheless corroboration of the statement seems to come from a quarter in which we should least expect it.

To the War Office inquiry we must add the views of Freudian psycho-analysts on the war neuroses. The subject is dealt with by Freud[10] and in a symposium of leading Freudians (Freud, Ferenczi, Abraham, Simmel, E. Jones), the question at issue being whether the war neuroses can be explained on the basis of a sexual etiology. The reply is that it can be regarded as due to auto-erotism and narcissism, the attachment of the sexual libido to the ego. The Freudians thus substitute 'self-love' for the 'self-preservation' of most British psychotherapists; but Freud in his *Introduction to Psycho-analysis* is less confident than his followers as to the correctness of this explanation. It is, however, of interest that in this symposium on war neuroses the only contribution on the subject of treatment (by Simmel) recommended a procedure similar to that originally practised by Freud, and to which he gave the name of 'abreaction'. This is of course playing into the hands of those who maintain that a full analysis in the Freudian sense is not to be recommended. This raises the question—however true the Freudian concepts, such as infantile sexuality, may be—whether for practical purposes of treatment a full analysis is the most effective form of cure. Both the length of time required for such analysis, and the occasional failure even after a long analysis, suggest that some more rapid and more effective method of treatment urgently needs to be practised.

*Cowardice.*—The question of cowardice and shell-shock is dealt with frankly but inconclusively, most witnesses declining to define cowardice. The different point of view of the legal and military as against the medical is most marked here. The reason for this is obvious when we remember the different ends in view—the soldier is concerned with his military objective, to which the individual must be ruthlessly sacrificed, even as the judge is out to protect society; whereas the doctor's aim is to cure the individual. Thus Major Dowson, barrister-at-law, says: 'Cowardice is showing signs of fear in the face of the enemy', against which we may put the statement of Commander Holbrook, V.C.: 'I used to feel in an awful funk at times'. The difficulty in coming to a decision as to definition is that fear is the chief factor in both cowardice and 'shell-shock'. The Committee came to this conclusion at least, that neither feeling fear nor manifesting the signs of fear constitutes cowardice.

The same difficulty is met with by the Committee in deciding as to the question of malingering, which depends on 'awareness of intention and motive to deceive'. It is held, probably correctly, that such awareness varies at different times even in the same individual. It is generally agreed that pure malingering was rare, but that skrimshanking was common. Dr. Mapother, however, gave a list of symptoms which cannot be malingered, such as tachycardia, vasomotor changes, enlargement of thyroid, and others. This, however, does not touch those more definite symptoms, such as pains in the back, headaches, paralysis, or amnesia, which are more usually malingered. The evidence on both cowardice and malingering, though inconclusive, and wisely regarded as such by the Committee, is well worth studying by every medical man who has to do with the questions of compensation and industrial medicine—for this purpose, if for no other, that he should not come to a too hasty conclusion, or form his judgement on too narrow a principle.

*Psychoneurosis and Psychosis.*—It is interesting, in view of the opinion so often stated that there is no essential difference between the psychoneuroses and insanity, to find that the expert witnesses agree that psychoses are not caused by or through the neuroses of war. "I regard 'shell-shock', said Dr. Stanford Read, "as having little or no relation to the production of insanity, except that the trauma, lessening inhibition, might possibly precipitate the onset of some smouldering psychoses". Dr. G. Roussy confirmed this: "I think the war created nothing in the way of the psychoses. It simply aggravated or revealed these manifestations in people who were predisposed to them"—as in incipient dementia præcox or general paralysis. The similarity of symptoms in neurosis and insanity should not therefore lead us to confuse them either in practice or in theory. Since the war neuroses are in no essential respect different from neuroses of civil life, the conclusions of the War Office report of experts is of the greater value and importance, even in civilian practice.

## HYSTERICS AND THEIR EMOTIONAL EXPRESSION.

The value that *experimental psychology* is destined to have in elucidating the psychoneuroses has been illustrated by the experiments of Golla and Prideaux[11] with the psychogalvanic reflex. Prideaux sets out to discuss the thesis of James and Janet *that the emotions of the hysteric are for the most part artificial.* The psycho-analysts hold, on the other hand, that the emotion is real but displaced. It is generally assumed that the strength of the emotion is commensurate with the amount of change in the viscera, blood-vessels, etc.; and further, that these visceral changes can be measured in a way by the galvanometer. The galvanometer thus gives us some indication of the emotions of the subject. In the presence of various excitements, e.g., a motor horn, various visceral reactions were manifested, with the following results. In the healthy the average decrease of resistance (in ohms) was 100, in anxiety neuroses 90·9, in conversion hysteria 36·3, in imbeciles 13·6, and in idiots 6 to 8. The conclusion is that in the hysteric there is a lack of visceral change due to lack of inhibitive functions by the cortex, and presumably a lack of emotion. Prideaux's results seem to confirm the opinion of Janet and James that hysteria is 'a tremendous verbal display with a hollow inside',

These results correspond to those of Golla:[12] "One young soldier suffering from a hysterical contracture of the foot broke down during an examination; tears rolled down his cheeks; he addressed his dead brother in language savouring of a South London melodrama; he asked why he himself had not been killed . . . and all the time, whilst he wailed and wept, the spot of light from the galvanometer mirror remained steady." One gets the same absence of response with the impassioned recitation of a piece of poetry, and Golla concludes that *hysterical behaviour is purely imitative.* The hysteric lacks emotion, and the "mind dissociated from feeling is mind very much at the mercy of any suggestion". It is to be remarked, however, that these conclusions are based on the idea that the emotions correspond to their physiological expression, by which they may be measured. All that Golla's experiments prove is that in the hysteric such physiological expression does not take place This may be interpreted in an entirely different fashion, namely, that the hysteric may have an enormous amount of real mental feeling, whether of grief, anger, or pain, without this producing corresponding visceral changes.

A further point is worth consideration. Emotion is expressed in two forms: voluntary muscular movements, and autonomic changes in glands, viscera, etc. It is found that the suppression of either of these encourages the other. "When some central excitement is aroused and much muscular movement reflexly results, there is very little galvanic response, whilst, on the other hand, the suppression by reflex inhibition of the muscular reflex is accompanied by a larger response." Prideaux merely draws the conclusion from this that it is the inhibitory functions of the cortex which determine the reflex. But the observation is of greater practical importance. It corroborates the clinical observation of one's patients that it is those who act least who 'feel' most; the patient who is most overborne by the sadness of the poverty, sickness, and misery of men is usually the one who *does* least to alleviate these conditions; whilst the philanthropist who gives active expression to his pity is the most cheerful of men. Put otherwise, an excess of hysterical feeling is in direct proportion to the lack of voluntary expression. The hysteric feels because he does not act.

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## PUBLIC HEALTH ADMINISTRATION OF TO-DAY.

(*See also* Anthrax; Housing Acts; Maternity and Child Welfare; Milk Supplies, Pure; Small-pox.)

*Joseph Priestley, B.A., M.D., D.P.H.*

The activities connected with the Public Health Department of a sanitary or local authority are many, and the day has now gone by when such activities were restricted to providing the inhabitants with pure air, pure water, and pure food. Many different administrative duties are now included, and such duties are not only of a preventive character, but may also, in part, include treatment. There can be no efficient public health administration without the inclusion of the following departments, in the form of schemes: (1) Maternity and child welfare; (2) Tuberculosis (prevention and treatment); (3) Venereal diseases (prevention and treatment); (4) Infectious diseases (prevention, treatment, and nursing); (5) Housing; and (6) General sanitary work (cleansing and dealing with refuse).

Of these, No. 1, maternity and child welfare, is the most important, concerning, as it does, the very foundations of life. Every mother who faces motherhood has a right to expect that her baby shall be born under proper conditions, and that her baby, when born, shall have a right to live. Can a maternity and child welfare scheme be too efficient, having regard to these facts? Such a maternity and child welfare scheme would include also a milk distribution or milk assistance scheme, a municipal milk depôt, and a pure milk supply. Welfare centres, maternity hospitals, maternity homes, midwives, etc., all come in for consideration, as do also crèches or day nurseries, infants' observation hospitals or hostels, nursery schools, etc. All these institutions are needed for dealing with the child from birth (and before birth) up to five years of age, when the child is handed over to the school or education authority, which should form a sort of extension of the maternity and child welfare scheme—at least in so far as medical inspection and treatment of school children are concerned, with the necessary provision of a properly-organized school medical service and the establishment of school clinics. In this way the child passes from childhood through puberty into adult life, when it becomes one of the ordinary adult inhabitants of the district, requiring the usual general sanitary supervision dealing with factories, workshops, work-places, shops, out-workers' premises, etc.

Efficiency of administration of a Public Health Department depends upon the staff, which must be sufficient as well as efficient—medical officers, inspectors (male and female), health visitors or nurses, clerks, etc.; whilst, last but not least, a sympathetic and enthusiastic committee and council are a *sine qua non.*

The other schemes, tabulated as Nos. 2, 3, 4, 5, and 6, speak for themselves, and are self-explanatory by their titles.

Economy, as such, must not be the main consideration, as it is impossible to carry out necessary sanitary reforms without the expenditure of money—an expenditure that may prove to be an economy.

## PULMONARY TUBERCULOSIS. (*See* Tuberculosis, Pulmonary.)

## PYELOGRAPHY. (*See* Kidney, Surgery of.)

## QUINIDINE.

*Dr. C. Lian.*

(*Translated by Carey F. Coombs, M.D., F.R.C.P.*)

### 1. Administration in Auricular Fibrillation or Flutter.—

*Dangers and Contra-indications.*—Many practitioners have an exaggerated idea of the dangers of using quinidine for auricular fibrillation or flutter. As a matter of fact, serious accidents have been exceptional, and will become more and more so now that both contra-indications and modes of administration are better understood.

The contra-indications to the treatment arise out of its dangers. Cases of acute asystole have been reported. This accident is easy to explain, for quinidine has a depressant action on the myocardium. But it will become less and less frequent, for all writers agree in giving a course of digitalis before quinidine, and not giving the latter in cases of cardiac insufficiency until and unless a favourable reaction to the former has been achieved. It is therefore wise not to give quinidine for cardiac failure resisting treatment.

Syncope has also been noted; but this is an incident rather than an accident. As the administration by increasing doses becomes more generally adopted, it should become rarer. The writer has only once seen it: in an old man whose arrhythmia had resisted a course of progressive doses, to whom a further single massive dose was given.

Since quinidine depresses myocardial conductivity, i.e., interferes with the transmission of the exciting stimulus through the cardiac muscle, it has been known to cause bradycardia by auriculo-ventricular dissociation, with or without giddiness or fainting. This fact prompts one not to try to get rid of auricular fibrillation by giving quinidine in cases where there is also more or less bradycardia.

*Embolism* is the real danger. If there are clots within the auricles, they may easily be set in motion by contractions of the auricle which, becoming regular, also become more effective. This accident has actually occurred several times under treatment of auricular flutter or fibrillation by quinidine. But it is not peculiar to quinidine, being a rather unusual but inevitable drawback to all vigorous cardiac treatment. It may happen with digitalis or ouabain. Yet there is no question of giving up active cardiac treatment for fear of embolism, lest by so doing the blood-stream be further slowed, the formation of clot increased, and the risk of embolism much more often incurred. The only sensible precaution is to avoid the use of quinidine if the patient has already had one or more emboli.

*Method of Action.*—According to the researches of Mines and Garrez, completed and confirmed by Lewis, fibrillation and flutter arise from two chief factors. First, the exciting stimulus does not spread easily along all the muscle fibres of the auricle; it is continually finding itself blocked and diverted into side-tracks, so that its journey becomes much longer than normal. Second, the auricular muscle fibres, being in a hyper-excitable condition, quickly recover after contraction the capacity to be excited afresh, i.e., their refractory period is shortened. At length, then, the exciting stimulus travelling its lengthened path is continually meeting with fibres ready to contract. Thus there is set up an endless 'circus movement' of auricular contractions at a high speed, varying from 200 to 600 per minute.

According to Lewis, quinidine acts chiefly by lessening the excitability and therefore increasing the refractory period of the auricular muscle. In this way the 'circus movement' may be broken up. On the other hand, it increases the speed of conduction of the stimulus through the auricular walls. According to the balance between these two effects, one may meet with success or failure in treatment by quinidine.

*Details of Administration.*—As a rule a course of cardiotonic treatment is given before the quinidine—digitalis or ouabain with or without theobromine—e.g., 5 to 10 drops per day of the 1–1000 solution of crystallized digitalin for a week. Then quinidine sulphate is given, usually in tablets containing 0·2 grm. each, by the mouth. With so active a drug the intravenous method is not without risk. Two plans of *dosage* are in use, the one beginning at once with full doses, the other using a rising scale of dosage. The writer's experience leads him to support the latter plan, for it affords a progressive test of the patient's susceptibility, thus avoiding accidents, while securing results quite as good as those achieved by the other method. On the first day two tablets are given, and the dosage is increased by one tablet per diem. The tablets are swallowed like cachets, one at the beginning of a meal, or else at some interval after a meal. A maximum of 10 tablets a day may be attained, but only if the drug is perfectly tolerated. Of course, there is no object in surpassing the dose at which the rhythm becomes regular. In most cases a maximal dose of 6 to 8 tablets per day is enough.

Having reached this dose step by step, it is maintained for a day or two, then decreased by a tablet every day, or every other day, till a dosage of 5 tablets per day is reached. The present writer agrees with most others in thinking that quinidine should be given for about a week after the arrhythmia has disappeared. A first course of quinidine should cover at least a fortnight, and it is practically never necessary to exceed a total dosage of 20 grm. Here, for instance, are two typical courses of quinidine, expressed in terms of tablets per day. An average course: 2, 3, 4, 5, 6, 6, 7, 7, 6, 6, 5, 5, 5, 5. An unusually high dosage for a resistant case: 2, 3, 4, 5, 6, 7, 8, 9, 10, 9, 8, 7, 6, 5. Success is usually attained during the first week, but may be looked for up till the end of the second week. In the event of failure it is well to adopt Wybauw's plan and try another course later; this may sometimes achieve a success.

Not seldom there are incidents which may tempt a timid or unenlightened patient to drop the treatment. It is therefore advisable to forewarn the patient of these possibilities, and also to add a word as to their innocuous nature and the fact that quinidine, and quinidine alone, can free him from his arrhythmia.

The disturbances are of two kinds, digestive and cerebral. Of the former, the chief is colic with diarrhœa. This may be avoided, or at least minimized, if the food given during the course of quinidine be of a non-irritating kind. Fruit and green vegetables should be forbidden, and, if necessary, meat, milk, and eggs. As to cerebral symptoms, there may be headache, giddiness, noises in the ears, deafness, and even staggering. As a rule these symptoms are so slight as to cause but little discomfort, and should not be allowed to interrupt the treatment, unless they are unusually intense.

Before the rhythm becomes regular, there is often a phase of regular tachycardia (at 120 to 160), which gives place abruptly to the normal rhythm, at 70, 60, or even 50 per minute. But sometimes this tachycardia persists, and on this quinidine has no effect. Under such conditions, according to Clerc and Deschamps, digitalis should be tried to the point of saturation, as it may bring the tachycardia to an end.

*Return of the Rhythm to Normal.*—The statistics go to show that in fibrillation or flutter the normal rhythm is restored by quinidine in about half the cases. The writer has had 40 per cent of successes (10 out of 24 patients). In what cases may success be anticipated? Clerc and Deschamps, in cases studied electrocardiographically, had no successes and 4 failures in pure fibrillation, 5 successes and one failure in mixed flutter and fibrillation, 3 successes and one failure in pure flutter. They conclude that pure fibrillation is always resistant to quinidine. Other writers, however, Lewis among them, report examples of auricular fibrillation terminated by quinidine, and Wybauw even thinks that quinidine is more effective in fibrillation than in flutter.

It appears, therefore, that there is at present no means, electrocardiographic or otherwise, of foretelling success or failure. Vaquez and Leconte say that flutter and fibrillation are more readily abolished when there is no valvular lesion present. But as four of the writer's successes had valvular lesions, this does not contra-indicate the use of the drug. The best cases are those in which the arrhythmia is of recent origin, or occurs in paroxysms.

*Duration of the Restored Rhythm.*—Most of the published results show that the return to a normal rhythm is only transient. In a majority the arrhythmia has recurred after a few days, sometimes after a few weeks. Lasting cure is rare. The writer's successful results, on the other hand, have been durable in a majority—practically in 7 out of 8 successes, for two of his ten successful cases were not observed for long enough to judge as to durability. Among these 7 lasting successes, the heart remained regular in 4 for seven months and a half, seven months, four months, one month; in another for ten months except for a few days' arrhythmia in the course of the fourth month; in the other two there were periods of a few hours or days during which the arrhythmia recurred, disappearing again each time either spontaneously or under quinidine.

*Maintenance of a Regular Rhythm.*—The secret of these good results lies in keeping up the treatment. The writer was early convinced of the need for this. Several times the reappearance of the arrhythmia was directly due to a halt in the prosecution of the treatment. The one case in which success was ephemeral was that of a woman who, after regaining a regular rhythm in her first course of quinidine, developed an intolerance for even one or two tablets a day. Further, Clerc and Deschamps had two lasting successes out of 12 cases in which normal rhythm was restored, and in these two the quinidine treatment had been kept up. It seems, therefore, as if this was essential; and the writer has, after many experiments, adopted the following plan with satisfactory results. After the restoration of the normal rhythm, 5 tablets daily should be given for a week. For the next three weeks, five days of quinidine, 5 tablets per day, should alternate with five days of crystallized digitalin, 0·1 mgrm. per day. After this the patient should take 4 or 5 tablets of quinidine daily for the first five days in each fortnight, and 0·1 mgrm. of digitalin for the first five days of the second week in each fortnight.

*Relief of Symptoms.*—Some writers think the return to normal rhythm does not relieve symptoms. Others, again, take the opposite view. The writer has seen much relief afforded ; several patients have been enabled to return to work. The relief is owing to a maintenance of a regular rhythm. The writers who deny that symptoms are diminished must have seen only transient successes.

*Conclusion.*—The rarity of accidents, the frequency of success, its continuance under persistent treatment, and the great relief thus afforded to the patient, make quinidine a valuable acquisition in the treatment of auricular fibrillation and flutter.

2. **Use in Other Types of Arrhythmia.**—So far quinidine has been but little used for arrhythmia other than that of auricular flutter or fibrillation. Several attempts, however, deserve notice.

*Premature Beats.*—Boden and Neukirch, also Clerc and Deschamps, had no successes in 22 and 4 cases respectively. But Haas had 3 successes out of 6 cases ; and, better still, F. M. Smith, giving 0·2 mgrm. tablets three times daily, saw extrasystoles disappear 10 times out of 20 cases, and in 7 others diminish notably in frequency. The writer has had a few successes with a daily dose of 0·6 to 0·8 grm.

*Paroxysmal Tachycardia.*—Haas and Hamburger had no successes in one or two attempts ; Boden and Neukirch had several successes, but by the dangerous intravenous method. On the other hand, F. M. Smith got good results in two cases by giving the drug between the attacks. In one case not enough time has yet elapsed to admit of a judgement. But the other case is very striking. Instead of two or three attacks a month he has only had one in seven months, and that during a pause in the taking of quinidine. The writer has recently had a similar experience. A patient had first of all a severe attack, and then a series of one or two daily, each lasting a minute or less, for three weeks. These stopped from the first day of taking quinidine, three or four of the 0·2-grm. tablets daily.

*Sinus Tachycardia and Bradycardia.*—Quinidine is contra-indicated in bradycardia. It has met with occasional success in simple tachycardia, particularly in exophthalmic goitre.

*Conclusion.*—Quinidine sulphate, in medium doses (3 to 5 of the 0·2-grm. tablets per day) may be used with success for premature beats, in paroxysmal tachycardia if given between the attacks, and in certain forms of sinus tachycardia.

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## RADIOTHERAPY. (*See also* ELECTROTHERAPEUTICS *and* $X$-RAY DIAGNOSIS.)

*C. Thurstan Holland, Ch.M.*

**Malignant Disease : 'Deep Therapy'.**—Last year attention was drawn to the Erlangen treatment and to its claim of exact dosage; since then the subject of 'deep therapy' has received much attention throughout the world. At the Congress of Radiology and Electrology, held in London in June, 1922, two days were allotted to papers and a discussion on this subject, and whilst it was generally conceded that Wintz and Seitz had rendered valuable service in the advancement of $x$-ray therapy in malignant disease, and that this advance might have far-reaching effects in the future, the general opinion seemed to be that there was no proof existing that—as was claimed—either (1) a stimulating or (2) a lethal dose of $x$ rays had been established. Neither was the technique advocated by the Erlangen workers considered by all to be the best, and many speakers preferred the 'large area method' emanating from Frankfurt (the Dessauer technique), which is very similar, generally speaking, to that advocated by Gilbert Scott in this country. In direct support of the latter method, especially in cases of breast carcinoma, we have the work of Sampson Handley, who believes that far wide of the original growth there is a 'spreading edge' of cancer, and that recurrent nodules after operation are well within the area of this edge; he argues from this that in applying $x$ rays it is necessary to expose to full doses all the area in a wide circle around and distant from the site of the original tumour and from the scar of the operation wound, and that attention directed merely to the area of the primary growth or to the secondary nodules is doomed in the end to failure, although the growth or the nodules, as the case may be, are for the time being profoundly affected even to the point of actual disappearance. Turning to the so-called lethal and stimulating doses of Wintz, there are many points which make it difficult to believe that these have been established. It is laid down that 110 per cent of a specially measured stream of a special quality of $x$ rays is lethal as far as the cancer cell is concerned; that anything materially less than this, if administered to such cells, stimulates their growth. If this was in fact the case, then the question of treatment would be uncommonly simple; but unfortunately, all cases of cancer do not respond in this simple manner, and cancer often goes on growing notwithstanding that it has been given this so-called lethal dose. Further, it is a well-known and established fact that recurrent nodules, and even ulceration, in and around a scar after the breast removal, will disappear completely after receiving a series of repeated small doses from an apparatus of primitive type not passing more than 1 ma. through a tube of a moderate degree of hardness: a dose which would come well within the limits of this so-called stimulating dose. It is certain that we are a long way yet from the cure of malignant disease by $x$ rays, and a still longer way from the displacement of surgery by radiation treatment.

In some cases, specially selected, it is possible that the primary use of $x$ rays or radium, or the combined use of both, may offer a better chance to the patient than the knife; but granting that this is the case, it is well to remember that although $x$ rays and radium can bring about wonderful results, even they cannot do this unguided, and that it is of the utmost importance that treatment by these agents should be controlled and carried out by those who have special knowledge. It is important from the point of view of the patient that as much care should be taken in choosing the radiologist as in choosing the surgeon. The mere possession of an $x$-ray apparatus or a small amount of radium does not confer on the owner any special knowledge, and does not make him or her a reliable individual for the application of either or both agents to the treatment of malignant disease. Treatment by $x$ rays and radium is not now a rule-of-thumb method; each day it is becoming more and more scientific; and the modern methods of application which are necessary to secure both the safety of patients and the best results require training, knowledge, and skill of the highest order. The time has passed for the haphazard use of radiations, and it is now the duty of medical practitioners to see, when advising patients to consider the question of *x*-ray or radium treatment, that they send their patients for both advice and treatment to real, and not sham, experts. This has been too little appreciated in the past, and even at the present time is not fully recognized. The time has gone by altogether for the idea that the mere application of *x* rays and radium is sufficient, and that they can be applied by anyone, and that they will succeed or fail entirely on their own merits. It is now necessary to recommend patients to consult a radiologist who is especially expert in administering radiation treatment, one who not only can administer the correct treatment, but can also advise as to its suitability or not, and it should be recognized that it is not merely a question of *x* rays or radium curing a disease, but of an expert use of the *x* rays and radium by one who has an expert knowledge of their action, and an expert knowledge as to how to use and control them.

There is an important point to be remembered in connection with the *x*-ray treatment, not only of malignant disease, but of other conditions in which *x* rays are used and are of benefit, and this is that in the present demand for so-called 'deep' therapy it should not be forgotten that the older method of repeated small dosage often has many advantages, and that it is a method which most decidedly must not be discarded and looked upon as being out of date. Treatment by well-filtered streams of very hard *x* rays has its essential advantages in the treatment of deep-seated cancer, and especially it appears to be of use in *cancer of the cervix* and *uterus*. It appears to be equally certain that the repeated small-dose method is more suitable for most *skin conditions*, and for the treatment of such diseases as *exophthalmic goitre, splenomedullary leukæmia*, and *superficial tuberculous glands*. It is a method which, if carefully carried out, entails no risk to patients and has no unpleasant effects. Properly carried out the risk to the skin is practically nil; even in the treatment of exophthalmic goitre, which necessarily means treatment prolonged over a very long time, sometimes on and off for years, there should be no danger even of resulting telangiectases. It is easy to avoid over-dosage both to the skin and to the organ under treatment, and the terminal results are quite as good as those produced by the more dangerous methods of modern, so-called, 'deep' therapy. It is, perhaps, somewhat unfortunate that the term 'deep' therapy has been applied to this method of treatment. In all methods the aim of filtration is to cut out as many as possible of those rays which are not required; if we are treating subcutaneous glands we use a filter to cut out those rays which would affect the skin and would never reach the gland; but nevertheless a large number of rays are produced which penetrate both skin and glands and the tissues on the other side, and which are eventually dissipated in remote parts after having passed right through the patient. If it were possible we should no doubt attempt to devise some means to prevent these rays penetrating the patient, but this cannot be done. At Erlangen the attempt has been made to produce a stream of very hard *x* rays and to direct this stream to the part under treatment, at the same time cutting out by filtration, as far as is possible, those radiations which would be absorbed by the tissues superficial to the deep-seated growth; also to produce an apparatus and a method of using it which increases in proportion the volume of the effective *x*-ray stream; perhaps a better descriptive term for this method than 'deep therapy' would be 'hard-ray therapy'.

Anderson[1] gives a good account of deep therapy as carried out at Erlangen. In this paper the methods of application are considered, and results are classified according to the method employed: whether $x$-ray therapy alone has been used, $x$-ray therapy plus radium, $x$ rays plus copper electrolysis, or $x$ rays plus packing with paraffin blocks. The opinion is expressed that the addition of copper electrolysis is proving satisfactory. One point especially emphasized is that the old days of haphazard $x$-ray applications have gone; that this newer method of treatment as carried out in Germany demands the intimate co-operation of clinician, pathologist, physicist, and radiologist; and that it is only by a combination of these, and by attention to every minute detail, that successful results will follow. One of the most reliable of the French radiologists, Béclère,[2] in a thoughtful paper, discusses this treatment from the point of view of what should be hoped for and what should be feared. He emphasizes the dangers, especially the blood changes which ensue, the occurrences of intestinal lesions, and—in the massive treatment of leukæmia—the danger of the death of the patient. In conclusion, he points out that the radiotherapy of sarcomata and carcinomata is not such a simple proceeding as the formulæ of Seitz and Wintz would suggest; also that these high penetrating rays are not always necessary, are not without danger, and not always efficacious.

Ward[3] gives an excellent account of the Erlangen technique, the principles on which it is built up, and the results obtained by its use in the treatment of *fibromyomata* and *malignant disease*. The author adds a note of warning: he expresses the opinion that this method of carcinoma therapy is one in which the $x$-ray dose is so near to being a dangerous one that, unless the radiologist has an intimate knowledge of the apparatus, of the technique, and of the principles upon which it is based, harm rather than good is the probable result. Seitz and Wintz[4] themselves review their experience in the treatment of *sarcoma of the uterus* over a period of five years. Out of 5 cases, 2 are alive five years after treatment. On the whole, from the point of view of length of life following treatment, their results are far better than those of surgery.

Those interested in the physical foundations of deep therapy will find much valuable information in a paper by Dessauer[5], in which in the first place he studies the physical conditions, and then follows this up with the development of the electrical and technical sides of the question; also in another paper by Holfelder,[6] which deals *in extenso* with the underlying principles in the radiotherapy of malignant tumours in the surgical clinic of Professor Schmieden, of Frankfort. There is a large amount of useful information in simple form in both these papers, and it is very definitely laid down in the latter that, although the effect of radiation in many types of surgical disease is very gratifying—in fact, in many cases quite astounding—the results are not yet sufficiently uniform to justify abandoning surgical operation in operable cancer except under very special conditions.

Other papers which should be read on this subject are those with which a discussion on the $x$-ray treatment of deep-seated cancers was opened at the British Medical Association Meeting at Glasgow. Riddell[7] reports his own results in the treatment of 60 cases, recognizing that not enough time had elapsed for any definite conclusion to be reached, but at the same time being much impressed by his immediate results. Webster[8] enters somewhat minutely into the technique, and discusses from a critical point of view the so-called 'cancer dose'. He also, in speaking of immediate effects, states that in his opinion those he has obtained could not have followed on any other method of treatment. Hernaman-Johnson,[9] whilst fully recognizing that the Erlangen treatment is an advance both in instrumentation and in technique, is not so impressed with its results as others appear to be. Finally, there is the danger to the patient of delayed reaction, and Soiland[10] draws attention to this in a thoughtful paper, entitled, "Super-radiation and Delayed Reaction", in which he also discusses the importance of, and the methods in use to ensure, protection to patient and operator. Delayed reactions occur in cases quite unexpectedly, and have been observed as late as three years from the date of the last *x*-ray treatment without giving any sign of their insidious approach. Soiland has seen personally several cases in which, two or three years after radiations for uterine conditions, the abdomen has taken on gangrenous changes too extensive for surgery and uninfluenced by any treatment. These followed on the older methods of treatment, and he considers that with the newer super-radiation therapy the risks of these must be enormously increased.

**Exophthalmic Goitre.**—Murray,[11] in a paper entitled "Hyperthyroidism", after discussing the various types, and comparing simple hyperthyroidism, toxic goitre with hyperthyroidism, and exophthalmic goitre, enters into much detail as regards treatment. He compares the results obtained by *x* rays, radium, and surgical interference. Of 100 cases quoted as treated by *x* rays, none died; 76 per cent either recovered completely or regained good functional activity suitable for ordinary life. He considers that the period of disease or invalidism is materially shortened by *x*-ray treatment. He also believes that radium is unsuitable for very severe or acute cases, as the primary effect is often to accentuate the hyperthyroidism; cases are quoted of death following rapidly on the first application. Exophthalmic goitre is very prevalent in the United States, and three papers by Holmes,[12] Tyler,[13] and by Allison, Beard, and McKinley,[14] indicate very clearly the lines on which *x*-ray treatment is generally carried out by American radiologists. For treatment, a Coolidge tube is used at a spark-gap of from 8 to 10 inches, filtering with 4 to 6 mm. aluminium, 3 to 4 areas at each sitting, and a total dosage of about 30 ma. minutes. The treatment is repeated about every three weeks, and results are obtained in from six to twelve months. Holmes makes frequent basal metabolism tests, especially in the earlier part of the treatment, and stops treatment as soon as this reaches the normal. Handek and Kriser,[15] in summing up their own and others' opinions, conclude that the good effect of *x*-ray therapy can no longer be questioned; that results are best in the young and in cases of short duration; but that in chronic cases good results can frequently be obtained; that statistics show that the percentages of unsatisfactory results in operation and in *x*-ray therapy are similar, but that as regards mortality after treatment this is definitely in favour of *x* rays, which have no mortality. [Since I published a paper based on 20 cases treated before 1908,[16] and in which views were expressed very favourable to *x*-ray therapy, a very large number of cases have been treated under my supervision, both in private practice and in hospital. In my opinion, at the present time, *x*-ray treatment properly carried out is the treatment of election for exophthalmic goitre in every case, acute or chronic, in which it is possible to adopt it. It is unfortunate that the large majority of cases are sent to the radiologist only as a last resort, when all other so-called methods of treatment have failed, and when the patient is frequently in an advanced stage of the disease. With a vivid recollection of the many apparently hopeless-looking cases I have seen restored to normal life by *x* rays, I cannot help thinking that it is now the duty of medical practitioners to urge *x*-ray treatment on the first appearance of symptoms and immediately the diagnosis has been made. If this were done as a routine we should have very few of the advanced cases now seen so frequently, and the question of surgical interference would rarely, if ever, arise. Personally I am still in favour of the older small repeated dosage with moderate filtration. In the large majority of cases this method will effect results ; it is quite safe for the patient ; if properly conducted there is no reasonable danger to the skin—not even telangiectasis. I have seen one case develop myxœdema ; this case had very much less *x* rays than many others, and whether the rays had any real causative effect is doubtful. An objection raised so often to *x*-ray treatment is the long time it takes to cure. The answer to this is that—apart from surgical interference and its risks—it cures more certainly and more quickly than any other method of treatment.—C. T. H.]

**Carcinoma of the Thyroid.**—Pfahler[17] advocates the use of *x* rays in this condition, and cites cases in support of his thesis. One case, after a partial operation in which all the growth could not be removed, was treated by the fractional-dose method for about ten months in all ; both clinically and from sections the growth was carcinomatous ; the patient was alive and in perfect health eight years after the treatment. Others lived for periods of years following treatment and then died from metastases, the local result having been excellent. The author concludes that all cases should receive post-operative treatment, and that a reasonably good hope of success can be entertained in those cases which are for one reason or another not suitable for operation.

**Tonsils and Adenoids.**—Witherbee[18, 19] has added further papers to the one referred to in the MEDICAL ANNUAL, 1922, on the *x*-ray treatment of *hypertrophy of the tonsils.* He compares the results obtained in focal infection of the throat by *x*-ray treatment with those obtained by surgery, and very much favours the former method ; he uses 500 cases of his own, and quotes the results of others, in support of his argument. In this paper also the technique, which is very simple, is illustrated and explained. It is considered that the method is especially indicated in the chronically infected throats of vocalists. Herrman[20] also gives his results in 54 cases, describing a similar technique. The number of treatments averaged from six to eight, given at fortnightly intervals. One month after commencing treatment, *Streptococcus hæmolyticus* and *Staphylococcus aureus* disappeared, and at the end of the treatment every tonsil had become normal in size.

**Diphtheria Carriers.**—Hickey[21] has tried *x* rays on diphtheria carriers. In 15 out of 19 throat cases, in 4 out of 6 nose cases, and 4 out of 9 cases of otitis media in which the bacilli were present—all cases selected by the medical officer of the Board of Health—entire disappearance was effected in a very short time. The technique adopted is published, and it is remarkable that some of the results followed upon one or two exposures only. [There is no doubt from this and other reports that this method of treatment is one deserving of attention.—C. T. H.]

**Chronic Diseases of Bones, Joints, and Tendons.**—A paper by Philips and Finkelstein[22] emphasizes the use of *x* rays in the treatment of chronic *septic wounds,* chronic *arthritis, ganglia,* chronic *tenosynovitis,* chronic *pyogenic osteomyelitis, tuberculous arthritis* and *osteomyelitis,* etc. The authors conclude that the *x* ray is probably the greatest but least used therapeutic agent in the orthopædist's armamentarium, and they anticipate in the near future *x*-ray therapy departments in all large orthopædic clinics. Many cases are quoted in this paper illustrating the effects and results which can be safely brought about by using a proper technique.

**Dermatology.**—*X* rays are probably the most useful single therapeutic agent that the dermatologist possesses to-day. So writes Hazen[23] in an article in which he reviews his results obtained on his private patients. He gives a list of the many skin conditions in which he has found by practical experience that

$x$-ray treatment is beneficial, and tabulates his results. As a general indication to practitioners of what $x$ rays can do in skin diseases, when properly directed, this paper is valuable, and it contains a vast amount of practical information in a small compass. Mackee and Andrews[24] write on the same subject. They also agree as to the value of $x$ rays in dermatology, and enumerate 80 skin conditions amenable to $x$-ray or radium therapy. A further paper on the *eczema* group by Eichenlaub,[25] based on 100 cases with an average duration of over two years, suggests that the routine use of $x$ rays in these cases is justified, that it is superior to any other form of treatment, and that only 4 cases out of the 100 failed to respond or were only partially benefited. In *acne vulgaris* J. H. Martin and C. L. Martin[26] consider that all types improve under $x$-ray treatment, provided that the proper degree of skin reaction is obtained. The authors illustrate their paper with photographs of cases, and with microphotographs. They also point out the importance of the standardization of $x$-ray apparatus, and the care which is necessary in the measurement of dosage.

**Hæmophilia.**—Saint-Paul[27] has tried the effect of irradiating the spleen in cases in which the subcutaneous injection of peptone is ineffectual. The whole spleen should be irradiated, and it is suggested that the dose should not exceed one-third of an erythema dose. The irradiations cause a rapid return to coagulability of the blood, and hæmorrhages cease ; the effect, however, is very evanescent and passes off in a few days.

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## RAT REPRESSION.

*Joseph Priestley, B.A., M.D., D.P.H.*

The Rats and Mice (Destruction) Act 1919 has been operative for two years, and thousands if not millions of rats must have been destroyed in that time. Are we any better off ? 'Rat weeks' are becoming, like 'baby weeks', almost an obsession in some districts. The Medical Officer of Health of the City of London sums the matter up in a recent report. He says :—

1. Rat infestation, if uncontrolled, will depend upon the amount of food that is available for the rats, and rat repression depends upon the amount of food available.

2. The endeavour of local authorities must be to keep the rat increase at its *minimum* by : (*a*) Rendering premises rat-proof (including satisfactory drainage and sewerage) ; (*b*) Catching or killing rats which have already infested premises, e.g., by traps, poisons, rat catchers, dogs and cats, etc.

N.B.—Remember that the black rat can climb, so that the rendering of premises rat-proof must not be restricted to the basement or ground floor, but must extend to the highest floor of a building. Telegraph wires and telephone cables may act as rat-ladders into buildings.

By these means, a *minimum* infestation may be attained ; but if preventive measures are relaxed, the maximum will be quickly attained (in proportion to the amount of food available) owing to the prolificacy of the rat. What more can be done ? That has yet to be suggested by the experts ; but in the meantime the Medical Officer of the City of London offers the following suggestions :—

1. Rat investigation and repression to be regarded as coming under the heading of general sanitary work, and to be referred to the district and factory and workshop inspectors to report on rat-infested premises, with a competent inspector, attached to the department, to supervise the execution of the remedial measures necessary.

2. Remedial measures to be the responsibility, not of the occupier alone, but of both the occupier and the owner—of the owner when structural defects exist such as favour the harbouring of rats and prevent the occupier dealing effectually with infestation, and of the occupier for ridding his premises of casual infestation when structural conditions are such as enable him with reasonable care to do so.

3. Rat catchers (suitable and reliable) to be registered with the local authority, and controlling regulations to be framed.

4. In view of the difficulties of the problem and the practical impossibilities of exterminating rats by present known methods, research work to be not only encouraged, but to become a function of a central department.

It is noteworthy that the recently-issued Sanitary Officers Order 1922 includes amongst the duties of a sanitary officer, if the Local Authority so decide, that connected with the Rats and Mice (Destruction) Act 1919, and the orders and regulations made thereunder. A feeling is growing up against the use of the so-called 'virus' rat poisons—generally a strain of the Gaertner *Bacillus enteritidis*, which might infect the intestinal canal of a rat, with resultant death, a resultant 'carrier' condition, or recovery (and immunity). The danger to human beings is obvious, and, as a fact, in several recent cases of 'food poisonings' (due to paratyphoid infection), the question of probable source from rat poison has had to be carefully considered. No direct evidence, however, has been available up to the present to incriminate 'rat viruses', and consequently no legislation has been brought forward. The attitude of the Government Department concerned is definitely expressed, and only the innocuous (to human beings) rat poisons made from barium compounds and squills are recommended.

## RECTAL FISTULÆ.

*J. P. Lockhart-Mummery, F.R.C.S.*

Of recent years, early evacuation of abscesses has been insisted upon by all rectal surgeons as the most important means of preventing the formation of fistulæ. As a result possibly of this, it appears that operations for fistulæ are not so common as they were. At St. Mark's Hospital, for instance, there has been a progressive fall in the number of cases of fistulæ admitted during the last ten years. I believe this to be due in the main to doctors taking more care to open ischiorectal abscesses at an early stage, and to better methods of treating these abscesses. It has been found at the hospital from experience, that when an ischiorectal abscess is freely opened at an early stage, a fistula very seldom results.

G. S. Dudley,[1] discussing the etiology of ischiorectal abscesses, attributes a very small percentage to tubercle. He quotes Walsham, who found that out of 891 cases of pulmonary tubercle there were only 5 cases of fistula and 2 of ischiorectal abscess, while in 133 post-mortems of tuberculous cases only one fistula was found. S. G. Gant[2] estimates 10 per cent of cases of fistula as being due to tubercle.

At St. Mark's Hospital, where very careful investigation was made by inoculating guinea-pigs with part of the wall from a series of cases of fistula, Mr. Gabriel found that 15 per cent were tuberculous—a slightly higher percentage than that arrived at on clinical evidence only.

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## RECTAL TUMOURS.

*J. P. Lockhart-Mummery, F.R.C.S.*

Diagnosis.—A great deal has been done in recent years to improve the method of diagnosis in cases of rectal tumour, but there is still much room left in this direction. At St. Mark's Hospital last year, no less than 83 per cent of the cases of rectal tumour seen were quite inoperable when first examined. Most of the cases had been previously under medical observation for varying periods of time.

Obviously the first necessity is to know when to suspect the presence of a tumour; and secondly, having become suspicious of the presence of such a lesion, to know how to carry out the examination so as to enable one to arrive at an accurate diagnosis for or against the tumour. Early diagnosis in such cases is so important that too much care cannot be taken. In these days the success or otherwise of operations for cancer of the rectum are almost entirely dependent upon an early diagnosis.

*Suspicious Symptoms.*—(1) Irregularity of the bowel actions, more especially chronic or spurious diarrhœa; (2) Intermittent bleeding. Either of these symptoms is frequently present apart from the presence of a tumour, but they are nevertheless important enough to warrant our excluding this cause. Any patient with such symptoms should be thoroughly examined as a routine measure, and the examination should include: (*a*) Exploration of the rectum with the finger, aided by pressure upon the abdomen with the other hand, i.e., bimanual examination; (*b*) A sigmoidoscopic examination of the rectum and lower sigmoid. When a growth, or any suspicious lesion, is found, a portion of the growing edge should be removed through the sigmoidoscope with crocodile forceps for microscopic examination, which should always be entrusted to a competent pathologist. This should not necessitate the use of an anæsthetic, and can be quite easily carried out. The distance above the anus of the growth, and its extent and mobility, should be ascertained as far as possible, and the patient should be carefully examined for the presence of secondary deposits in the glands, liver, etc. His general condition should be carefully investigated as regards the proper functioning of the kidneys, heart, blood-vessels, lungs, etc., and from the opinion thus obtained his suitability, or otherwise, for an operation may be judged. It must be remembered that in these days, provided due care is taken, and regional or spinal anæsthesia used, there are very few contrary indications to the removal of cancer of the rectum provided the growth is not too advanced.

### Cancer of the Rectum.

The general opinion of surgeons appears to be in favour of a perineal, or posterior, resection of the rectum rather than an abdomino-perineal resection as a routine measure, the latter being reserved for cases unsuitable for a posterior resection. This was the view that the writer put forward at the meeting of the British Medical Association at Cambridge in 1920, and results up to date appear to more than justify this view. The very low mortality which can be obtained by a posterior resection (the writer's figures were 49 cases and 1 death) is alone sufficient justification for this procedure as a method of choice rather than the abdomino-perineal operation, which even in the most skilled hands has a mortality of not less than 30 per cent. Moreover, the high risk involved by the abdomino-perineal excision negatives the performance of this operation in any but favourable cases, and it must be remembered that cancer of the rectum is a disease of advancing age, and occurs at a time during a patient's life when vitality is not at its highest, and when concurrent disease is common. No operation for cancer of the rectum can be considered entirely satisfactory unless it is applicable to the great majority of patients suffering from this condition. Posterior resection under regional or spinal anæsthesia can be performed with very little risk, even on patients who are extremely bad subjects for any operation. As a proof of this the following cases which have been operated upon during the last few years may be mentioned: one woman, age 55, with aortic aneurysm; one patient with Graves' disease; one with chronic bronchitis; and one with albuminuria. All these patients did perfectly well, and would certainly have been denied operation had it been necessary to perform an abdomino-perineal excision.

The important question, however, is that of recurrence, and if it can be shown that this is very much less after an abdomino-perineal than after a posterior resection, this would be a very serious argument in favour of the former method. So far as figures are available at present this does not appear to be the case. While the percentage of recurrences after abdomino-perineal excision should certainly be less than after posterior excision, owing to the more extensive area removed, the difference is not as great as might be expected. The writer's figures for 1915–17 show 36 cases of cancer of the rectum operated upon by posterior resection, with 17 patients alive and well five years after the operation. So far no figures of abdomino-perineal resection have been published giving a lower recurrence mortality than this.

One of the most important factors in obtaining good results in cancer of the rectum, whatever operative method is used, is the employment of regional or spinal instead of general anæsthesia. A very interesting paper by Gaston Labat[1] gives a careful description of the method of producing complete anæsthesia of the posterior part of the pelvis and perineum sufficient for a posterior rectal resection by means of regional blocking of the nerves by **Neocain.** It also describes the method of producing anæsthesia of the abdominal wall for the performance of preliminary colostomy. The anæsthetic used is a 0·5 per cent solution of neocain containing 5 min. of adrenalin 1–1000 per 100 c.c., the total quantity of this solution used varying from 100 to 200 c.c. The method is somewhat difficult and requires considerable practice; but the results are admirable. Anyone interested in regional anæsthesia for this purpose will do well to study this paper. While spinal anæsthesia is certainly simpler, the results obtained by regional anæsthesia are even better. From a study of thirty-three cases in which operations were performed in the Mayo Clinic under this method of anæsthesia, he concludes that previous disease does not seem to influence the operative risk, provided no acute process prevails at the time of the operation; that chronic lesions of the heart, with or without compensation, are not contrary indications provided the resistance of the patient seems fair; and that pulmonary tuberculosis does not seem to influence the operative prognosis. One patient with diabetes, age 72, was quite successfully operated upon.

Dr. Léon Imbert[2] has published a paper on "Resection of the Rectum and Prostate for Cancer."

### MYOMA OF THE RECTUM.

A very interesting paper on this curious condition appears by Verne C. Hunt.[2] True myomas of the rectum are exceedingly rare. They arise from the muscular coat of the bowel, and correspond to myomas found in the uterus. There is often a varying amount of connective tissue, and they have been classified as myomas, fibromyomas, and myofibromas, according to the amount of fibrous tissue they contain. In a few cases bony granules may be present in addition to fibrous tissue, and sometimes it may be almost impossible to distinguish between one of these tumours and sarcoma. Steiner collected eight cases of myoma of the rectum. The tumours varied in size from 2 cm. in diameter up to a mass weighing 12 lb.

Symptoms are generally due to mechanical causes, such as blocking of the rectal lumen or pressure on the nerves. The mucous membrane over these tumours is as a rule unaltered, and it is by this that they can be distinguished from malignant tumours, which, with the exception of sarcoma, are practically always accompanied by marked ulceration.

These tumours grow exceedingly slowly, and may last for many years without causing any serious symptoms. They seem to be slightly more common in females than in males, and they occur at almost any age from 21 to 85. Some of them have undergone secondary malignant change. In women the condition appears sometimes to spread from the uterine wall direct to the rectum via the posterior uterine ligament, and a case of this kind was described by Mr. Miles last year at the Proctological Subsection of the Royal Society of Medicine. The reviewer operated upon a similar case recently, in which a young woman had three or four large masses almost completely blocking up the rectum and continuous with the uterus via the right uterine ligament. A complete resection of the rectum became necessary. There were several separate tumours, typical myomata. An exact diagnosis can only be made by microscopical examination, although the condition may be suspected, and complete removal of the tumour would appear to be the only possible treatment; but as the tumour is of an innocent character, local removal should be sufficient where this is possible.

Hunt describes a case at the Mayo Clinic where the tumour was enucleated from the wall of the rectum with satisfactory results. The exact method of removing these tumours depends upon their extent and the part of the bowel wall involved; but the prognosis, if the mass is completely removed, should be good.

A very full discussion of the condition, and a careful account of twenty-four cases, will be found in Dr. Hunt's paper.

References.—[1]*Johns Hop. Hosp. Bull.* 1922, April, 134; [2]*Presse méd.* 1922, Jan. 21, 60; [3]*Ann. of Surg.* 1921, Aug., 236.

## RECTUM, INFLAMMATION OF. (*See* Proctitis.)

## RECTUM, PROLAPSE OF.

*J. P. Lockhart-Mummery, F.R.C.S.*

The modern view of surgeons with regard to prolapse of the rectum is that the mechanism producing this condition is closely related to that of hernia. As in the case of hernia, two factors are necessary. There must be a weak place in the wall of the abdominal or pelvic cavity, and there must be some viscus which can come down and bulge through the weak part. It is now fairly well recognized that in order to cure prolapse of the rectum it is necessary not only so to deal with the rectal wall that it will not tend to push itself through the anal opening, but to restore the continence of the anal sphincter so that there will no longer be a weak spot to invite prolapse. In other words, a proper repair of the sphincter muscle is a necessary part of any operation for prolapse of the rectum, just as a repair to the perineum is necessary in dealing with a prolapse of the uterus.

A. V. Moschcowitz,[1] in a leading article, discusses this aspect of rectal prolapse. He advocates complete obliteration of the pelvic cavity by means of non-absorbable sutures. While agreeing with his views as to the causal factors which produce prolapse, one cannot, the reviewer thinks, agree with the treatment suggested. Complete obliteration of the pelvic cavity by means of sutures cannot be obtained with any certainty, and would be liable to cause other troubles from adhesions of the pelvic organs. Very good results may follow proper fixation of the rectum by the writer's method, which has already been described in the ANNUAL (1922, p. 369), combined with a suitable plastic operation upon the sphincter, and would seem to do all that is necessary.

REFERENCE.—[1]*Surg. Gynecol. and Obst.* 1922, May, 680.

## RECTUM, SIMPLE OR INFLAMMATORY STRICTURES OF.

*J. P. Lockhart-Mummery, F.R.C.S.*

It used to be taught that the common cause of simple stricture of the rectum was tertiary syphilis. This mistake is still found repeated in many modern text-books, and even at the present day most of the specimens of stricture of the rectum in the London hospital museums are labelled 'syphilis'. Evidence in favour of syphilitic origin in these cases is far from convincing. At a discussion held at the Subsection of Proctology of the Royal Society of Medicine in November, 1922, the general opinion of rectal surgeons present was that syphilis is a very rare cause of such strictures. The opinion put forward by Sir Charters Symonds, who opened the discussion, was that the common cause was gonorrhœa followed by chronic sepsis. The fact that a patient with an inflammatory stricture of the rectum has a history of syphilis does not warrant one in assuming that the latter is the cause of the stricture.

Professor Henri Hartmann,[1] in an address delivered before the Medical Society of London, gives a very full description of the condition. He thought that it was commoner in women than in men, but not to the extent that was generally supposed. Thus, out of 86 cases, 50 were in women and 36 in men. He found evidence of previous syphilis in 34·8 per cent of his own cases. Gonorrhœa was present in a number, and tubercle in 8·6 per cent.

A common form of stricture is the cylindrical or funnel-shaped one in the lower part of the rectum, with dense fibrous walls. There is almost always considerable ulceration, chiefly below the stricture, and large fibrous polypi are frequently present. Fistulæ are common in association with these strictures, but the internal opening is always below the stricture.

The ideal treatment is complete resection of the stricture. This can be done by an intrasphincteric amputation, much like a Whitehead's operation for piles, the whole of the damaged portion of the rectum being removed, and the mucous membrane brought down and sutured to the skin at the anal margin. This is by no means an easy operation, and may easily involve freely opening up the peritoneum, which, considering the case is generally thoroughly septic, is no light matter. The results in a considerable number of cases are good. Unfortunately it is seldom possible to perform this operation, as the disease is so often found to be too extensive. Hartmann advises under such circumstances that the rectum should be excised as in the case of cancer. He has performed excision in this condition in 34 cases with 2 deaths.

The best treatment, when the condition is very advanced and there is severe sepsis with a tight stricture, is to perform a colostomy, the stricture being dealt with later, if possible by excision. In less severe cases, where the degree of stricture is not serious and the contraction is near the anus, dilatation with graduated bougies may be carried out; but a cure is seldom obtained unless the disease is in an early stage when the treatment is started.

Hartmann does not approve of internal proctotomy for this condition, as he considers it dangerous. The writer, however, has practised internal proctotomy, i.e., division of the stricture with a blunt bistoury posteriorly, followed by dilatation, for the last twenty years at St. Mark's Hospital, without a single untoward result. This operation, like internal urethrotomy, was discarded owing to the septic complications which were liable to result in pre-antiseptic days; but since the use of antisepsis it has been revived with excellent results. It requires to be carefully carried out, but gives very good results without subjecting the patient to any mutilating operation. It is not, of course, possible in cases of very extensive cylindrical stricture.

REFERENCE.—[1] *Lancet*, 1922, i, 307.

## REFRACTION.

*Lieut.-Col. A. E. J. Lister, I.M.S.*

E. Clarke[1] states that eye-strain may be 'the third partner' in many diseases. He quotes the saying of Duane, "It is the mark of the ophthalmogist, as distinguished from the mere refractionist, that he is able to discern the relative importance of all the factors, intra-ocular as well as ocular, and in some measure assign to each its probable effect". He thinks no possible good can be done by ordering + 1·0 D sphere in both eyes to a girl, say of 12 years of age, for near work. She probably has 10 D of accommodation power. If she is suffering from eye-strain, it is not the hypermetropia that is doing the harm, but a low degree of astigmatism, or anisometropia, or both, that have been missed. Hypermetropia, unless of high degree, or unless it produces squint, is harmless in *young* people. There is always compensatory enlargement of the ciliary muscle. If a young person wears glasses they should be worn *always*, though not necessarily at games. Clarke finds from his notes that, by so doing, many such errors have disappeared.

*Myopia.*—Full correction should be ordered for all young myopes, and for old ones if they can stand it. The glasses should be worn *always*, to train the ciliary muscle to do its work and avoid undue convergence.

*Presbyopia.*—Presbyopes have arrived at the stage when very often they have big responsibilities and worries. Their nervous energy must be safeguarded. If eye-strain is present they should be given both distant and near glasses. The accommodative power should be measured. If a man of 60 has as good accommodative power as the usual man of 50, he will only want the glass usually taken by a man of 50, and vice versa. A long-armed man who likes to read on his lap will want a weaker plus glass than normal.

*Cycloplegics.*—These should be used in every case under 40 or 45. With certain exceptions Clarke uses **Atropine** for all cases under 20. Clarke believes in the ophthalmometer, but wisely says "its usefulness comes by practice".

[Clarke's article is worth reading by practitioners who do refractions. The remarks on presbyopia are to the point. It is well to remember that some presbyopes have weak convergence. If the necessary apparatus is not at hand to test this, a simple safeguard is to err on the side of under-correction. —A. E. J. L.]

SOME NEW TESTS FOR ASTIGMATISM.—E. E. Maddox[2] describes some new tests for astigmatism, which he was kind enough to demonstrate to the writer. Maddox constantly uses them, and finds them of great practical value. He describes them as follows:—

1. *The* 'V' *Test.*—For this test the capital letter 'V' is made to perambulate around the periphery of Snellen's small fan of lines, either with the hand or, better, with a string from a distance (*Fig.* 40). The 'V' acts, firstly, as an *indicator*, and secondly, as a *confirmer*. As an indicator, it enables the surgeon to make sure as to which ray of the fan the patient sees best, without the necessity of large figures, which lessen the simplicity of the chart to the patient's eye. Having found the ray, the 'V' is next used as a confirmer, to test the correctness of the patient's choice, for, if the correct ray has been chosen, the two arms of the 'V' will appear of an equally vivid blackness. The 'V' should now be moved a little to one side, until a difference appears in the blackness of

the two arms, and then to the other side in the same way. In each case the blackest arm will look towards the spot for the correct angle.

If, on the other hand, before moving the 'V' from the chosen ray, one arm looks blacker than the other, the patient's selection of the ray was evidently not perfect. The 'V' should always be moved in the direction of its blackest arm until agreement in the blackness of the two is arrived at. It will now be found to stand opposite the correct spoke of the fan. As in all tests of this kind, the patient's head should be held perfectly upright, and he should be made myopic for one of his two principal meridians; emmetropic, or only faintly myopic, for the other. In other words, the case should be rendered by lenses one of simple myopic astigmatism.

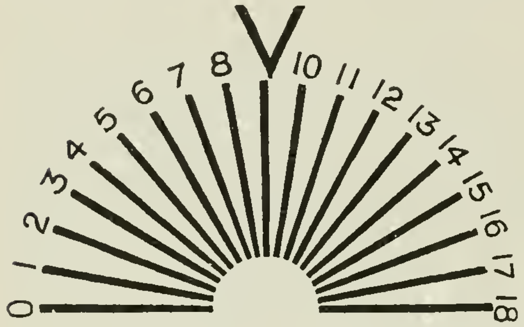


*Fig.* 40.—Maddox 'V' test for astigmatism. The 'V', can be moved on a semicircle until it indicates the blackest of the radiating lines; and its two arms may be compared with each other, as an additional test.

In most cases he finds the 'V' test to be of surprising delicacy, though with slow-minded patients repetition is sometimes necessary until they have learned how to compare different depths of black in the two arms of the 'V'. One advantage of Snellen's fan is that it detects cases of irregular astigmatism. If one line be black, for example, its two neighbours faint, and the third or fourth black again, the case is proved to be one for which all lines and stripes are unsuitable, and the 'V' test should not be employed. For such cases test types only are permissible.

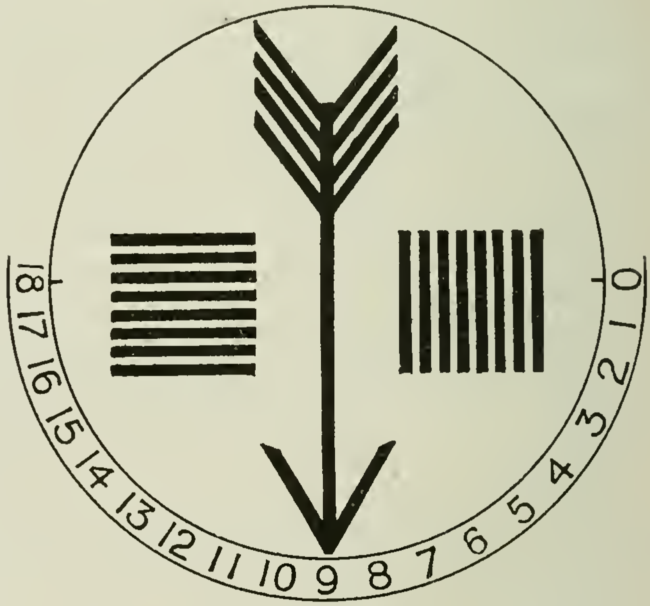


*Fig.* 41.—Maddox 'Arrow' test for astigmatism. The arrow is turned until its two feathers appear equally 'clean,' then minus cylinders are used to make the lines at right angles to the arrow as black as those parallel with it.

2. *The Arrow Test.*—This consists of a broad arrow bisecting a large cardboard disc, rotatable about its centre, and with a square of stripes on each side of the arrow. A fixed graduated semicircle below completes the apparatus (*Fig.* 41). On turning the tail of the arrow in the direction of the 'cleanest' feather till the two feathers appear equally clean, the arrow head points to the required axis. As a confirmation, the two edges of the arrow head should then also appear equally matched, and the shaft of the arrow show its best definition. The axis being thus determined, to find the amount of astigmatism it only remains to direct attention to the squares, and insert minus cylinders in the trial frame till one is reached which equalizes the clearness of the two sets of stripes. A small minus sign on the edge of the cardboard disc, 90° from the arrow-head, indicates the axis of this

required minus cylinder. It is, of course, taken for granted that the eye is made faintly myopic for the whole chart to begin with, and before inserting cylinders the correct spherical correction should be made for the best square.

If desired, the 'V' test and the arrow test can be joined together with three cogwheels, when a single string and weight can operate the whole set from a distance.

3. *Infant's Test.*—For very young children to whom the idea of an arrow is not familiar, and who confuse the left hand with the right, he uses two squares called 'pocket-handkerchiefs', one above the other, so as to require no 'right' or 'left', and two striped circles called 'balls', also one above another. A child is quick to see which is the 'cleanest handkerchief' and the 'prettiest ball', and thinks it rather a nice game. It is needless to say that retinoscopy has to be trusted to chiefly in small children, but a subjective confirmation has its value also.

REFERENCES.—[1]*Practitioner,* 1922, Feb., 119; [2]*Amer. Jour. Ophthalmol.* 1921, Aug., 571.

## RELAPSING FEVER.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGY.—F. W. Cragg,[1] from a lengthy study of the prevalence of relapsing fever in the United Provinces of India during the epidemic prevalence of 1917–20, found that the onset of the outbreak is slow and the duration long, with a sudden increase in the deaths in April and May, and a fall in June, the greatest incidence being about a month later than that of plague; adults are affected more than children, and males more than females. These important facts allowed of the examination of the statistics for evidence of past outbreaks, revealing a major epidemic in 1862–3, the probable occurrence in the United Provinces of the great Bombay epidemic of 1877–78, and an unrecognized one in 1895–96, from which time minor outbreaks occurred, mainly in the northern Doab and sub-montane district, up to the recent severe epidemic. The work of the French observers on the transmission of the disease to monkeys through the louse was confirmed, and its rôle in a hot climate studied with interesting results. The pediculus was almost universally present on the native population, but these insects are much affected by temperature conditions, being greatly reduced in numbers during the very hot weather in May and June in the United Provinces, although the slightly lower temperatures of the early hot weather months are very favourable to the activity and rapid hatching and development of the lice. These observations furnish a simple explanation of the recent epidemic prevalence of relapsing fever, as the increase began in the hot weather of 1917, when the maximum temperature in May was nearly 10° below the normal, and consequently very favourable for the prolonged maximum activity of the lice, and the same conditions prevailed to a large extent in the previous epidemic years, especially in 1877, which fact should allow of the outbreaks being foreseen in the future. Experiments on the effect of exposing clothes to the sun during the hot season to rid them of lice were not very successful, prolonged exposure all day with frequent turning over being necessary to reduce the lice.

REFERENCE.—[1]*Ind. Jour. Med. Research,* 1922, July, 78.

## RENAL FUNCTION TESTS. (*See* KIDNEY FUNCTION TESTS.)

## RETINA, DISEASES OF.

*Lieut.-Col. A. E. J. Lister, I.M.S.*

*Arteriosclerosis.*—R. Foster Moore, in his recent work, *Medical Ophthalmology,*[1] has given an excellent and concise account of his subject, embodying in it his own original work. The book is well illustrated and printed, and well worth getting by those interested. Moore has made a close study of arteriosclerosis for years, and, as we would expect, there is an excellent account of it. The retinal changes are considered under two heads :—

1. *Retinal Arteriosclerosis.*—In this condition there is an increase in brightness of the reflex from the retinal arteries or the 'copper-wire arteries'. The 'arteriovenous crossing', in which the thickened artery hides the vein on each side for some distance, is seen. Moore says that these signs indicate a high degree of sclerosis. Though it would appear that the flow through the vein must be obstructed, he is convinced that any appreciable distention of the vein is of quite unusual occurrence. Irregularity of the lumen of the arteries, and retinal hæmorrhages, are the other chief signs.

2. *Arteriosclerotic Retinitis.*—Following on the condition of the arteries above described, exudates in the retinal tissues may appear, giving rise to 'arteriosclerotic retinitis'. The exudates may take the form of bright white dots and spots in the retina. The individual spots are very seldom larger in diameter than one of the main veins, but occasionally a few large plaques develop. The disease is often unilateral, and appears to be more common in females than in males. It is important to recognize the development of retinitis, as the prognosis is rather more than twice as serious, in Moore's experience.

Amaurosis fugax or paroxysmal attacks of blindness, usually affecting one eye at a time, followed by recovery of vision in periods varying from a few minutes to several hours, is said to be ascribable in most cases to local arteriosclerosis. (*See also* EYE AFFECTIONS WITH DISEASE OF OTHER ORGANS.)

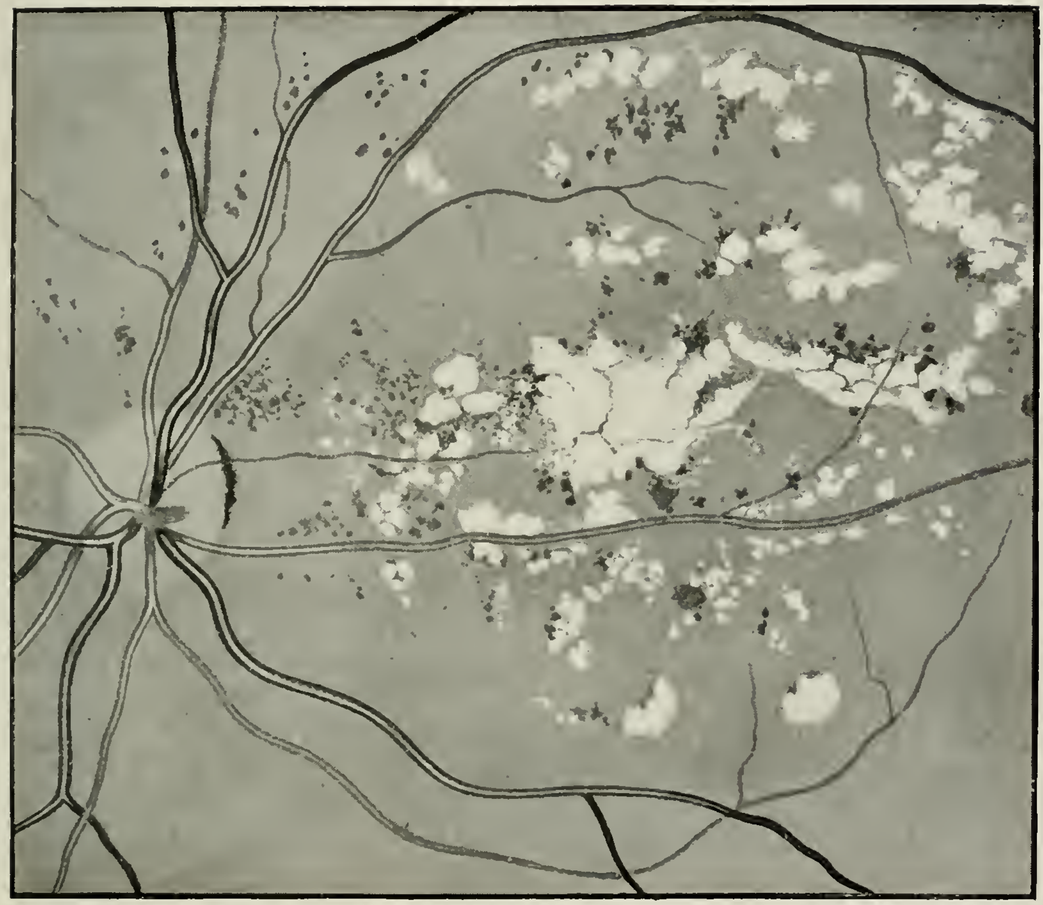
[The experience of the reviewer during eight years' work in the Lucknow Medical College Hospital, with a daily attendance of about 400 out-patients of all kinds, and with about 80 beds allotted to medical cases, is that arteriosclerotic changes in the eye are seen very much less frequently than in Europe. Diabetic retinitis, on the other hand, is commoner, as diabetes is probably more common. The out-patients attending the eye department in Lucknow would as a rule be less well fed than the English out-patients. Many are strict vegetarians, and though many would be meat eaters, the amount taken would be less than in Europe. He has met with arteriosclerotic changes in the eye going on to retinitis more frequently in private practice among well-to-do Indians, especially those who live in European style and take alcohol. The chief difference between their diet and that of the hospital patient would be the amount of meat taken,. It would be interesting and of practical value to know if this condition is less frequently seen in vegetarians in Europe. If it were the case, it might be possible, by a timely restriction of meat in families prone to arteriosclerosis, to delay or avert the onset of such changes. It is well known, of course, that many other factors enter into the causation of arteriosclerosis ; but many of these patients were well-educated men, no freer from cares and anxieties than the same class in Europe.—A. E. J. L.]

*Diabetes.*—The following features, when combined, suggest diabetic retinitis, though doubt has been expressed as to whether a retinitis due to diabetes alone ever occurs : (1) The patches of retinal exudate in diabetes tend to have sharp-cut edges ; are often solid, and soapy or waxy looking ; are usually distributed in an irregular manner ; and sometimes form an irregular ring, well wide of the macula. (2) A star figure is uncommon, and if present it does not acquire the degree of symmetry that may be seen in renal cases. (3) The soft-edged cotton-wool patches, so frequent in severe renal cases, do not appear in diabetes ; retinal œdema is never so marked, and thus retinal detachment does not result. (4) Retinal hæmorrhages are generally in the deeper retinal layers, and therefore are roughly circular in outline instead of being flame-shaped. (5) The circular retinal pigment spots which are not rare in the later stages of renal retinitis are not seen in diabetes. (*Plate XXXV.*) (*See also* EYE AFFECTIONS.)

# PLATE XXXV.

## DIABETIC RETINITIS

(R. FOSTER MOORE)



*From 'Medical Ophthalmology': kindly lent by Messrs. J. & A. Churchill*

*Syphilis.*—Moore says that if a small infant develops iritis who shows no signs of an acute illness, it is almost undeniable evidence of congenital syphilis. He believes that neither salvarsan compounds nor mercury will prevent development of interstitial keratitis. He has seen it develop at the early age of 3 years, in the child of a trained nurse, treated by mercurial inunctions from birth. (*See also* EYE AFFECTIONS.)

*The Milder Forms of Retinitis of Renal Origin.*—F. Terrien[2] points out that these cases have often only slight functional disturbances, and are only discovered when examining for slight visual defects. An unsuspected renal lesion is thus often discovered, which demonstrates the great value of an examination of the eyes and of the fundus, especially in general medicine. He describes the typical condition with œdema of the papilla, small hæmorrhages, white patches in the retina, and the star at the macula. Then there are the forms without any visible retinal lesion: uræmic amaurosis, central scotomata, alteration of the light sense; usually the colour sense is not affected, but there may be some slight alteration of the power of distinguishing red and green. Detachment of the retina is very frequent. Concerning glaucoma, Terrien gives a useful caution. Most of the patients are at an age when mydriatics should be used with caution, and some cases of glaucoma may be due to mydriatics used in examination of the fundus.

The prognosis is generally very unfavourable. Three-fourths of the cases die in the first year, though he has observed 6 to 8 per cent of cases for more than two years.

Treatment is that of the general renal condition.

[The reviewer's experience corroborates that of Terrien. A surgeon, apparently in robust health, consulted him about a slight haze that troubled him sometimes at the end of a long operation. His vision was $\frac{6}{5}$ in each eye, but a careful examination showed very slight retinitis. He started work again after three months' rest, though advised not to do so. He died within the year of uræmia. In every case of eye trouble in patients over the age of 45, in which there is any doubt, the possibility of its being renal in origin should be kept in mind, and the urine and fundus oculi examined. Terrien's warning about the use of mydriatics is worth remembering. The author has seen eyes lost from the use of atropine and homatropine in people over 40. If no **Homatropine** is available, a couple of instillations of 4 per cent **Cocaine** solution will suffice for the purpose of examining the fundus. The use of $\frac{1}{2}$ per cent **Eserine** solution after it, averts all danger.—A. E. J. L.]

*Etiology and Treatment of Detachment of the Retina.*—Uhthoff[3] discusses idiopathic detachment of the retina from primary exudation of serous fluid below, or the shrinking of newly-formed cellular tissue, together with shrinking of the vitreous and a secondary collection of fluid beneath the retina. He holds that many cases of retinal detachment are due to myopia, more especially the higher grades of myopia, and states that myopia was the cause of 61 per cent of his extensive series. He sees no good reason for rejecting the use of a **Pressure Bandage** (not too tight); advocates rest in the supine position, although a sitting posture is sometimes preferable, according to the site of the detachment. He favours **Diaphoresis**, but warns against too heavy subcutaneous injections of pilocarpine and unusually large doses of salicylic acid. Strong solutions of sodium chloride, up to 25 and 30 per cent concentration, as used by some, are dangerous, as they injure the tissues and may result in obliteration of the capsule of Tenon; in one case glaucoma, and in another hæmorrhages into the vitreous, resulted. Of 351 cases compiled of permanent reattachment of the retina, 24 per cent were brought about by operative procedure, 45 per cent by conservative treatment, and 31 per cent were spontaneous without treatment. In the writer's personal experience, about half of the reattachments were cases of spontaneous healing, 28 per cent were brought about by conservative treatment, and 22 per cent by operative intervention. About 9 per cent of all his cases resulted in final reattachment. He regards as one of the most harmless operative methods the simple or double **Puncture of the Sclera**, with as complete evacuation of the subretinal exudate as possible; recurrences are, however, common.

Marx[4] urges the necessity for trying every adjuvant means in treatment of detachment of the retina. He cites authorities to show that the ciliary body has a secreting function. When there is no intake of salt, the excess of fluid is cast off by the kidneys and the other secreting organs, among them the ciliary body. This forces more fluid into the vitreous body, increasing its bulk and weight, and thus tending to force the retina back into place. At the same time the **Salt-free Diet** is hastening the casting off of the fluid behind the retina, so there is no fluid to interfere with its attachment as it is restored to place. The intra-ocular pressure rises on a salt-poor diet. Hertel found that the pressure in the rabbit eye regularly subsided when a hypertonic saline was infused, and increased when a hypotonic saline was infused. The salt-poor diet thus acts on detachment of the retina from two points of vantage. Marx is now examining the tension of the eyes in patients with heart or kidney disease on a salt-poor diet. He has been applying the salt-free diet in the last eleven years, in 10 retina cases. The detachment was not recent in any case, and three were cured; one was of traumatic origin, one spontaneous, and one after choroiditis. The cure was slow and gradual in this group, and no other measures were applied. He does not include in the cured cases slight subjective or objective improvement. The tension improved in some with no change for the better in visual acuity. With kidney disease and retention of sodium chloride, inducing a tendency to œdema in various tissues, conditions favour detachment of the retina, especially as the intra-ocular tension is reduced at the same time.

R. Foster Moore[5] reports a case of detachment of the retina, in which a cure resulted after confinement to bed and treatment by injections over the site of the detachment under Tenon's capsule. About 15 min. of 5 per cent **Sodium Chloride** is injected one day, and three days later an equal quantity of 5 per cent **Sodium Citrate.** Four per cent of **Novocain** is added to each injection. This treatment is kept up till nine or ten injections have been given. [By the courtesy of Mr. Foster Moore, the reviewer had an opportunity of examining this case, and satisfied himself that no detachment could be made out.—A. E. J. L.]

*Late Traumatic Detachment of the Retina.*—H. Gifford[6] complains that most writers of ophthalmic text-books have failed to appreciate properly the relationship between an injury and subsequent detachment of the retina. He reviews a number of cases. He gives details of a case which first interested him in the subject. A boy of 11 was injured by a slug shot. The eye recovered completely, but a detachment of the retina occurred four years later. Gifford states that after comparatively slight blows, if the pupil is dilated and the whole retina carefully examined, the surgeon will be surprised to find how often lesions in the shape of small hæmorrhages or areas of opaque and raised retina will be found. In such cases Gifford thinks that prophylactic measures at the time may turn the scale in favour of future immunity. He keeps the patient in bed or sitting at ease, with both eyes lightly bandaged, for a week, and causes sweating by **Pilocarpine** and **Salicylates.** He asks the patient to avoid occupations and games where there is much chance of bumps and jolts for two years at least. He advises the patient not to settle for damages or compensation except on a contingent basis with full recognition in writing of the possibility of future loss of sight from late detachment. [Usually practitioners see these cases first, and often deal with them entirely. The measures advised will seem to many to err on the side of caution, but coming from an ophthalmologist of Gifford's experience are worthy of careful consideration. If by prophylactic measures we may possibly save an eye, they should be taken. The period of rest for a week and light bandaging could at least be easily carried out. The warning as to insurance is worth noting.—A. E. J. L.]

References.—[1]*Medical Ophthalmology* (London: Churchill) 1922 ; [2]*Presse méd.* 1921, Aug., 673 ; [3]*Deut. med. Woch.* (abst. *Jour. Amer. Med. Assoc.* 1922, April, 1173) ; [5]*Jour. Amer. Med. Assoc.* 1922, May, 1644 ; [5]*Lancet*, 1921, ii, 174 ; [6]*Amer. Jour. Ophthal.* 1921.

## RHEUMATISM.

*Charles E. Sundell, M.D., M.R.C.P.*

Poynton, Paterson, and Spence[1] have studied 172 consecutive cases of rheumatism occurring among hospital in-patient children under twelve years of age. They find that the incidence among girls is 50 per cent greater than in boys. The maximum number of first attacks occurred in the seventh year ; the liability to the disease increases rapidly from the second to the seventh year, and then declines more gradually. A marked seasonal variation, with maximal incidence in December and minimal in June, was observed. Chorea, which was present alone or associated with other rheumatic affections in 60 per cent of their cases, was found to vary exactly as rheumatism in its age and seasonal incidence. They describe two types of rheumatic attacks in childhood : in one, which is the more fatal, the picture is made up of tonsillitis, arthritis, and acute morbus cordis ; in the other the child has chorea, and a chronic endocarditis often leading to mitral stenosis. They find that the most common solitary manifestation of rheumatism in childhood is chorea. Morbus cordis occurred in 66 per cent of their cases, and it accounted for death in 21 of the 22 fatal cases, the exception being, apparently, an instance of acute salicylism. Their figures support the usual view that the presence of nodules is of grave significance ; 33 of the cases in this series showed subcutaneous nodules, and of these, 37 per cent died and 47 per cent became chronic invalids. They make the very unusual observation that in two cases presenting nodules no evidence of heart disease could be detected. Rheumatism, though less common among boys, is apparently more fatal to them than to girls. Many of the virulent cases ran a practically afebrile course. A noteworthy feature of the fatal cases was the taciturnity of the child ; the writers hold that " there is no doubt that this extreme taciturnity is a grave sign of a virulent affection of the heart ". They believe that the throat is the path of entry of the infection, and discuss the association of rheumatism with tonsillitis. Thirty per cent of the series had tonsillitis or enlarged and unhealthy tonsils, but in 10 per cent the tonsils had been removed prior to the rheumatic attack : it is therefore pointed out that though enucleation is a preventive measure of importance it is not a panacea for rheumatism.

Reference.—[1]*Proc. Med. Soc. Lond.* xliv, 45.

## RHINOSPORIDIUM KINEALYI.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

R. E. Wright[1] records a case of this protozoal disease affecting the lachrymal sac and the turbinate bones of the nose in a native of Madras, in which local applications of quinine had no effect; but under treatment with drops of 2 per cent **Tartrated Antimony** in water thrice daily the growth gradually got smaller, and disappeared in three months. Three cases of the same condition affecting the conjunctiva of schoolboys, without any signs except the small tumours, are also recorded.

Reference.—[1]*Ind. Med. Gaz.* 1922, March, 81.

## RIB, SLIPPING. (*See* SLIPPING RIB.)

## RIBS, CERVICAL. (*See* CERVICAL RIBS.)

## RICKETS.

*Frederick Langmead, M.D., F.R.C.P.*

ETIOLOGY.—After a period during which the etiology of rickets received little attention, a new phase was entered upon a few years ago—a phase of experimental study, which is still in progress. Hitherto, a deficiency of some recognizable food-element was generally regarded as the chief cause, notably a deficiency in fat. Some held that too little protein was equally to blame, and others that an excess of carbohydrate with relative deficiency of the other known food-elements was chiefly responsible. In spite of much careful and laborious work, it cannot be said that the problem of rickets has been solved. A great deal of information has been obtained concerning various contributing factors, but their relative degrees of importance remain in dispute, whilst the common denominator which must obtain in so distinctive a disorder as rickets is still to be found.

As recognized by the older clinicians, rickets is a disease which occurs mainly amongst the children of the poor, and usually begins between the ages of six and eight months. Most cases of early rickets are met with in the late winter and early spring months. Protracted suckling, cited by them as a contributing cause, would appear to have no relation to its incidence, for from a study of the social and economic factors of the disease in Glasgow by Miss Ferguson,[1] it emerged that of 200 non-rachitic children 24·5 per cent, and of 450 rachitic children 27·6 per cent, were breast-fed for over one year—a difference which, as she says, appears to be too small to lend support to the view that prolonged suckling influences the development of rickets. Moreover, in Japan and in India, to take two examples, where babies are often kept at the breast over a period of years, rickets is not noticed to result. It is a disorder especially occurring in the temperate zone, and is most prevalent among industrial populations. Findlay[2] estimates it as amounting to probably not less than 50 per cent of the general population of our industrial areas. Miss Ferguson,[3] from her inquiry into rickets in Glasgow, concluded that the health of the mother, or health and habits of the father, were only of importance in regard to their effect on the care given to the child and the conditions under which it lived. Previous diarrhœa appeared to exert greater influence, for it had occurred in 33 per cent of the rachitic but in only 11 per cent of those who were not rickety.

The possibility of an inherited disposition to rickets cannot be denied, although the study already referred to lends no support to the idea. As Noel Paton and Findlay[4] point out, the facts that rickets is common in dogs and unknown in cats, and common in some breeds of dogs and rare in others, seem to indicate an element of predisposition. The occasional occurrence, too, of severe rickets in every member of one family living under conditions no worse than their neighbours, must not be lost sight of.

Experimental workers have used, as their criterion of the existence of rickets, the characteristic changes in the bones seen either by radiographic examination or after death. It has no doubt been essential to choose a specific lesion of this kind ; but, in consequence, there is a tendency to regard the disorder as affecting the skeletal system to the exclusion of its other manifestations. It cannot be too much insisted upon that rickets is a disorder affecting not only bones, but ligaments, voluntary muscle, the blood and hæmopoietic system, the nervous system, the alimentary tract, and possibly unstriated muscle, and that its chief danger lies in a lowered immunity to infectious diseases. As the work has progressed, it has become apparent that some of the skeletal changes, produced experimentally and regarded as rachitic, are not in fact those of rickets, a correction which must be applied to some of the earlier investigations. This is especially true of the results of thymectomy, which appeared to indicate that the thymus gland is concerned in the etiology.

The many theories as to the cause of rickets cannot be discussed *seriatim* in this review; but a few may be considered, since they have led to much debate and have made our knowledge of the disease more precise.

*Rickets as a Food-deficiency Disease.*—In 1919, Mellanby[5] brought forward the results of his experimental work on puppies. He found that the diet most likely to produce rickets in them was one with a relative excess of carbohydrates, an adequate amount of protein, but only a small quantity of fat. This diet contained a sufficiency of water-soluble B and water-soluble C vitamins and salt.

In his hands, with this diet, rickets was produced. The experiment was pursued by adding varying amounts of fats, and noting their effect in preventing the bony changes of rickets or controlling their degree and rapidity. It emerged that animal fats were more protective than vegetable fats, and that the protective substance was distributed in nature in the same way as fat-soluble A. From this it was but a short step to infer that rickets is due to a deficiency of fat-soluble A, and is indeed a true food-deficiency disease.

This hypothesis meets almost all the requirements and agrees fairly closely with clinical knowledge of the disease, though Mellanby did not make the claim, which has been fathered upon him, that deficiency of fat-soluble A had been proved to be *the* cause of rickets. It coincides with the view generally held by clinicians that rickets is seen chiefly and in its most severe form among children fed on a diet, such as condensed sweetened milk, which contains an undue proportion of carbohydrate. Since fat-soluble A is contained in grass, the milk and butter of cows fed in pastures should be more protective against rickets, according to this hypothesis, than the milk and butter of stall-fed cows fed on cotton or linseed-oil cake—a possible reason for the incidence of recognized rickets chiefly in the winter and early spring months. The usefulness of cod-liver oil, the most accepted form of treatment, found also a ready explanation in its high fat-soluble vitamin content. Experiments with rats provided a serious criticism of the hypothesis, for in them a lack of this vitamin retards growth and does not cause rickets, whilst in puppies the degree of rickets was greater in proportion to the rate of growth. As the effects on rats and on puppies were so widely different, it is clearly unsafe to make a definite inference as to the results on children. Moreover, Mellanby found that the addition of lean meat to the ricket-producing diet prevented the development of rickets in puppies, and lean meat can contain but little fat-soluble A, whilst on the other hand the addition of green vegetables, which possess fat-soluble A in quantity, failed to protect them. In a later report, Mellanby,[6] as the result of further work, states that the following tend to prevent rickets in puppies: (1) Plenty of calcium and phosphorus in the diet; (2) Something associated with certain fats, probably identical with the fat-soluble vitamin; (3) Meat; (4) The possibility of exercise. On the other hand, the conditions which inhibit calcification, so that defectively calcified bone results, are: (1) A deficiency of calcium and phosphorus in the diet; (2) A deficiency of fat containing the antirachitic vitamin in the diet; (3) Excess of bread, other cereals, and carbohydrates; (4) Absence of meat; (5) Excess of the protein moiety of caseinogen free from calcium; (6) Confinement. From among these, he thinks that probably the most common cause of rickets in children is a combination of relatively deficient antirachitic vitamin and excessive bread.

In America, Hess, McCann and Pappenheimer,[7] Shipley, McCollum, and others[8] have been experimenting with rats. Hess used a large series of young rats and fed them on a diet containing no fat-soluble A, but otherwise satisfactory. Although they developed the usual signs of fat-soluble A deficiency, being retarded in growth and suffering from keratitis, none showed signs of rickets, and no microscopic evidence of rickets was found in the bones of twenty-two which were examined histologically. Shipley and McCollum, using an otherwise correct diet synthetically prepared, fed young rats on two forms of food, one defective in fat-soluble A and phosphorus, the other in fat-soluble A alone. In both, the usual results of deficiency in the vitamin occurred ; but in some of those deprived of phosphorus also, there were in addition bone changes resembling, though not identical with, rickets. The fact that the changes in rats are not quite true to those of rickets, deprives the experiment of some of its value.

*The Influence of Environment and Exercise.*—The existence of a dietetic factor in rickets is denied by many, notably by the Glasgow school. Findlay,[9] Noel Paton,[10] Miss Ferguson, and their collaborators see no relation between diet and rickets, and ascribe the disease to unfavourable environment, too limited air space, and lack of exercise. Findlay's experiments on dogs showed that, of puppies from the same litter, fed in a similar way, only those who were kept in confinement developed rickets. The inquiry by Miss Ferguson into the social and economic conditions of rachitic and non-rachitic children in Glasgow bore out his contention, for while no relationship between diet and rickets could be established, there appeared to be a definite one between the disease and the circumstances of the parents, the degree of maternal care, the amount of air space per unit of the family, and the amount of exercise. Corry Mann has recorded that among populations maintained by casual labour, the incidence of rickets increases during the period when wages are low and when the mothers go out to work in consequence.

The environment theory receives support from the inquiry made by H. S. Hutchison[11] into the conditions pertaining to the Nasike district of the Bombay Presidency. He finds that rickets there is almost confined to the well-to-do Hindoos and Mohammedans, who owing to purdah life are deprived of fresh air, sunlight, and exercise, but whose diet is far superior to that of the poorer class. The larger consumption of milk and ghee entails a greater supply of fat-soluble vitamin to the class which suffers most from the disease. Moreover, he states that in ten cases active rickets improved and became inactive by means of fresh air and exercise, without change in the diet or the administration of cod-liver oil. The evidence of Harriette Chick, Elsie Dalyell, and other workers in Vienna,[12] is contrary to the view of the Glasgow investigators, for they record that rickets developed during winter and spring under excellent hygienic conditions in infants receiving a diet composed of fresh milk from stall-fed cows to which sugar was added, and was prevented in the case of children receiving a diet containing cod-liver oil, more milk, and less carbohydrate.

Continuing their research, Noel Paton, Findlay, and Watson[13] took pups from the same litters. Some they confined in the laboratory and fed upon a liberal diet of porridge and full-cream milk ; they developed rickets. Others were placed at liberty in the country, but fed only on skimmed milk and porridge ; yet no rickets ensued. Again, by paying strict attention to cleanliness they have reared pups free from rickets on food containing a very small fat-content in a diet otherwise adequate in calorie value. From these experiments they conclude that deficiency in fat-soluble A is not responsible, but that lack of exercise is an important factor, and possibly, also, bacterial infection (in view of the effect of cleanliness). An infective element in the causation is supported by H. C. Cameron on clinical grounds.

*Effect of Sunlight.*—Hess and Unger[14] have shown that infantile rickets can be cured by frequent exposures to the sun's rays: the rachitic lesions, as shown by *x* rays, disappearing in the course of a month or six weeks, though the diet remains unchanged. The infants were given almost daily sun treatment of from one half to one hour. The same observers, as also Powers, Park, Shipley, McCollum, and Simmonds[15], have confirmed these clinical observations by experiments on animals, rickets being produced on a certain diet or prevented, according to whether rats were kept altogether in the dark, or exposed to the sun's rays for a definite period. These investigations were led up to by the previous experience of Huldschinsky,[16] Hess and Unger,[17] and others, of the usefulness of the mercury-vapour quartz lamp. More recently, Hess and Gutman[18] have shown that the curative effect of heliotherapy coincides with an increase of the inorganic phosphates in the blood. A similar increase had previously been reported by Howland and Kramer[19] as occurring in rickets during its cure by cod-liver oil, so that it appears that the action of these two curative agents is fundamentally the same. This, with other investigations, indicates that the phosphate content of the blood, rather than the calcium content, is of chief importance in the altered metabolism of rickets, and corroborates the analysis of Findlay, Noel Paton, and Sharpe,[20] who have demonstrated that there is no decrease in the calcium content of the whole blood of rachitic pups. Metabolic studies on children by the last-named observers led them to conclude that the evidence does not point to a primary disturbance of the metabolism of calcium.

*Pancreatic Disorder in Rickets.*—A different standpoint is taken by E. C. Dodds,[21] who adduces evidence which suggests a pancreatic deficiency. He found that the diastatic value of the urine is increased in active rickets, the mean of seventeen cases being 154. During convalescence this enforced value falls to normal. The fæcal fat is increased, the mean being 75 per cent as compared with 20 per cent for a series of normal children. A large proportion of this fat is in the form of unsplit fat. A possible explanation of the pancreatic defect upon rickets, as suggested by Dodds, is that there is a poor production of fatty acids, and consequently a lowered absorption of calcium.

*Acidosis in Rickets.*—Eric Pritchard[22] holds that any state of chronic malnutrition may result in rickets, through the intermediation of an acidosis. This sets up a prior claim on the alkaline bases, with a consequent deprivation of calcium to the developing bone. The fact that starvation is known to produce an acidosis, while it benefits rickets, is distinctly against this view; and, moreover, the work mentioned above, which minimizes the importance of the calcium content in the blood, has to be reckoned with. That amongst the many conditions in which acidosis occurs in children rickets must be included, the work of Dr. Amy Hodgson[23] shows, for she found that the ammonia ratio of the urine was considerably increased in thirteen cases in which it was examined. This, however, does not demonstrate its potency as a cause.

TREATMENT.—An important prelude to treatment is the recognition of rickets at a stage earlier than it can be diagnosed from the changes in the skeletal system, at least clinically. Pallor, sweating, especially of the scalp, querulousness, cutaneous hyperæsthesia, throwing off of the bedclothes, flabbiness of muscles, slight digestive disturbances, together compose the picture of rickets at a stage when treatment is generally quickly successful.

While the precise etiology remains uncertain, the practitioner cannot afford to neglect any of the measures, whether for prophylaxis or cure, which the experimental work indicates, and which indeed are little different from those which clinicians have employed for many years. Good hygiene, suitable food without proportionate excess of any element, and plenty of fresh air, have now abundant experimental and statistical work to support their claims to usefulness in prevention and cure. Two rules of hygiene have been brought into greater relief—the value of **Sunlight** and of **Exercise**; these should certainly take a more prominent position in treatment—the first by definite **Heliotherapy,** when possible; the latter, failing other means, by **Massage.** The work of Noel Paton and his co-workers brings home, too, the need for cleanliness and the avoidance and early treatment of mild infections, too often neglected. The administration of **Cod-liver Oil,** long known to be of value in most cases, receives support from much of the experimental work, while there appear to be good grounds for combining with it **Phosphates.** The value of **Calcium** is more in doubt.

References.—[1]*Med. Research Council, Special Rep.* No. 20; [2]*Ibid.*; [3]*Ibid.*; [4]*Ibid.*; [5]*Lancet*, 1919, i, 407; [6]*Med. Research Council, Special Rep.* No. 38; [7]*Jour. of Biol. Chem.* 1921, July; [8]*Ibid.* Aug. and Dec.; [9]*Med. Research Council, Special Rep.* No. 20, and *Lancet*, 1922, i, 825; [10]*Glasgow Med. Jour.* 1922, Mar., 129; [11]*Ibid.*, 145, and *Quart. Jour. Med.* 1922, Jan., 167; [12]*Lancet*, 1922, ii, 7; [13]*Brit. Jour. Exper. Pathol.* 1921, ii, 75; [14]*Proc. Soc. Exper. Biol. and Med.* 1921, xviii, May, 208, and *Jour. Amer. Med. Assoc.* 1921, July; [15]*Proc. Soc. Exper. Biol. and Med.* 1921, xix, Oct., 43, and *Jour. Amer. Med. Assoc.* 1922, Jan. 21; [16]*Zeits. orthop. chir.* 1920, May, No. 89, 426; [17]*Amer. Jour. Dis. Child.* 1921, Aug., No. 22, 186; [18]*Jour. Amer. Med. Assoc.* 1922, Jan. 29; [19]*Amer. Jour. Dis. Child.* 1921, Aug., 105; [20]*Quart. Jour. Med.* 1921, July, 352; [21]*Brit. Med. Jour.* 1922, April, 511; [22]*Ibid.* 1919, Nov., 627; [23]*Lancet*, 1921, Nov., 945.

## RINGWORM.

*E. Graham Little, M.D., F.R.C.P.*

Mitchell[1] comments on the greatly increased incidence of ringworm in the United States since the war, and explains it by the statement that many men returned with the infection and remained untreated. The most useful part of this paper is that devoted to cultural experiments and to treatment. Mitchell uses as a routine application an ointment of **Salicylic and Benzoic Acids,** but he advises a preliminary curetting of the macerated tissue. If this ointment fails, the substitution of **Chrysarobin** is recommended, in strengths up to 10 per cent if necessary. An important caution is added to investigate for sources of reinfection in cases which seem to resist treatment. Epidermophyton is very long-suffering; the author has grown fungus from scales boiled in 15 per cent potassium hydroxide. It is much easier to find the proof of the infection by searching for mycelia than by attempts to grow the fungus, and the parts likely to give the fungus most readily are the unruptured vesicle, or the dried scale left by it. The white sodden patches seldom show fungus. The author, from his cultural experiments, endorses the view expressed below by Williams as to the comparative infrequency of finding epidermophyton, as compared with trichophyton. In making the cultures the author advises drying the material, and notes that he has obtained cultures from scales ten months after collection. Much the commonest growth obtained by the author is described as a fluffy-white culture which was submitted to Sabouraud for an opinion, and was reported as "resembling *Trichophyton equinum*, but probably not that organism"; and it remains for the present unclassed.

*Ringworm of the Feet and Hands.*—Williams[2] describes three classes of clinical symptoms produced by mycotic infection of the feet: (1) The production of callus with scaling, a group first studied by Moukhtar. (2) Maceration of the skin between the toes, especially in the third and fourth interspaces, and the fold between the fifth toe and the sole. The symptoms may cease here, or the eruption may spread to the dorsum and sole, and the subjective symptoms may be negligible or very severe, with erosion of large portions of the skin.

Epidermophyton, although generally assumed to be the organism responsible, is certainly not the only form, and perhaps not even in a majority. (3) An eczematoid exudative patch often found on the instep and side of the foot near the sole. The eruption begins with small vesicles irregularly grouped, and drying is more rapid than in eczema. Eruptions on the hands are more difficult to classify, and diagnosis is more uncertain. Darier's dictum is quoted, that true eczema confined to the hands is extremely rare. When not due to external irritants, ringworm is a probable cause which should never be overlooked. Other forms on the fingers follow closely the symptoms of ringworm infection mentioned in the feet. The eruption classified as 'dysidrosis' is, in the author's opinion, always due to ringworm.

*Ringworm of Nails.*—This paper is based on a study of sixteen cases by Hodges,[3] in all of which microscopical confirmation of the diagnosis was obtained. In all the cases the nails were infected secondarily to other parts of the body, usually the thigh. There were fifteen men and only one woman. The toes were much more frequently the first digits to be affected. Three kinds of culture were obtained ; but as the media were not identical with those used by Sabouraud, the author prefers to leave them unclassified, except that he thinks all are trichophytons, and styles them A, B, and C ; the latter, probably, is to be identified with *T. gypseum* ; and A, and possibly B also, are to be identified with *Trichophyton rubrum*. The patient first dealt with had had the disease of the nails for thirty-five years, and it had resisted many forms of treatment. The author had a remarkable success with this procedure : The nails were **Scraped** repeatedly after applying 10 per cent **Potassium Hydroxide Solution.** An ointment consisting of **Benzoic Acid** 4 parts, **Salicylic Acid** 2 parts, **Vaseline** 30 parts, was spread on lint and applied to the nail every night, and kept in apposition with plaster.

*Trichophyton Purpureum* (Bang). *Trichophyton Interdigitale* (Priestley).—M. Ota[4] imported into the United States from Japan strains from three cases of ringworm—two of the nails and one of the groin. He grew these on media obtained from Paris, thus allowing of comparison with Sabouraud's classes. All gave typical cultures of *Trichophyton purpureum*, and the author states that this is much the commonest fungus producing groin ringworm in Japan and Manchuria, and, less commonly, of ringworm simulating dysidrosis ; and with other observers he comments on the immunity to infection with this fungus which the hair seems to enjoy. The author further describes experiments with 46 cases of dysidrotic ringworm in Mukden, in 18 of which he found *Trichophyton interdigitale* of Priestley, which he regards as identical with *Trichophyton gypseum* in Sabouraud's classification.

REFERENCES.—[1]*Arch. of Dermatol. and Syph.* 1922, Feb., 174 ; [2]*Ibid.* 161 ; [3]*Ibid.* 1921, July, 1 ; [4]*Ibid.* 1922, June, 693.

## RUBELLA.

*J. D. Rolleston, M.D.*

SYMPTOMS AND COMPLICATIONS.—Owing to the rarity of complications of any kind in this usually trifling complaint, the following reports by French writers are of considerable interest. During an epidemic of 291 cases of rubella in a military hospital, R. Bénard[1] saw 13 cases, or 4·5 per cent, with meningeal complications in the course of four months. The symptoms appeared between the sixth and eighth day. As a rule the cases were mild, but they might be serious and even fatal.

Bénard records a case in which symptoms of Landry's paralysis developed on the fourth day of a typical attack of rubella, death taking place three days later. The leucocyte formula was usually characterized by lymphocytosis, but a polymorphonuclear leucocytosis was sometimes present. As a rule there was a marked increase of sugar in the cerebrospinal fluid without any excess of albumin. Commenting on Bénard's communication, A. Florand and N. Fiessinger[2] report a case showing that rubella may give rise to complications similar to those of scarlet fever. Their patient was a previously healthy man, age 21, who six days after a typical attack of rubella developed a mild streptococcal septicæmia with endopericarditis and subcutaneous abscesses in the right tibiotarsal region, left popliteal space, and back of the left arm. The patient was on the high road to recovery when he was last seen.

T. S. Wescott[3] applies the term 'pseudo-rubella' to an eruptive disease which appears to be confined to infants between the ages of eight months and two years. The onset is abrupt, with a rise of temperature to 102° or 103°. The following day the temperature remains high, and nothing new is found except enlargement and slight tenderness of the posterior cervical glands. The posterior auricular and axillary glands are not affected, but the inguinal glands are sometimes enlarged. The temperature remains raised for the next two days, and on the evening of the fourth day a few discrete red macules appear on the neck, face, under the ears, or above the clavicles. On the fifth day the temperature is lower, and the rash covers the face, neck, chin, and shoulders. It is more discrete than the rash of rubella, and is not raised above the surface ; but in some areas, especially the loins and thighs, it shows a tendency to coalesce. On the sixth day the pulse and temperature are practically normal, and the rash begins to fade, disappearing in the next two days without leaving any trace. Pseudo-rubella differs from German measles —which it resembles in the appearance of the rash, enlargement of the posterior cervical glands, and febrile course—by its non-contagious character, its age distribution (the disease being confined to children under 2 years, while rubella is most frequent between the ages of 5 and 15), and its prolonged prodromal stages. Similar cases have been described by a number of other American writers, such as Zahorsky[4] in 1910, under the name of roseola infantilis, and within the last few months by Levy,[5] Veeder and Hempelmann,[6] Greenthal,[7] Greenberg,[8] and Park and Michael,[9] as well as by Naessens,[10] of Haarlem, in Holland. No cases of this kind have been described in any other country, nor has the reviewer met with any in over twenty years' experience of acute infectious diseases.

REFERENCES.—[1]*Bull. Soc. méd. Hôp. de Paris*, 1921, 1443 ; [2]*Ibid.* 1452 ; [3]*Amer. Jour. Med. Sci.* 1921, ii, 367 ; [4]*Pediatrics*, 1910, 60 ; [5]*Jour. Amer. Med. Assoc.* 1921, ii, 1785 ; [6]*Ibid.* 1787 ; [7]*Amer. Jour. Dis. Child.* 1922, i, 63 ; [8]*Med. Record*, 1922, 460 ; [9]*Amer. Jour. Dis. Child.* 1922, i, 521 ; [10]*Nederl. Tijds. v. Geneesk.* 1922, i, 396.

## SCALP, AVULSION OF.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Porter and Shedden[1] report a case of avulsion of the scalp, and give a review of the literature. A year and a half after the accident the head was covered with a thin shiny skin through which many blood-vessels showed, and which was adherent to the skull and only slightly movable. The denuded head had been skin-grafted by the Reverdin and Thiersch methods many times. The scalp intermittently tended to lose considerable portions of skin through pressure or microbic invasion. About four years after the accident, the superficial ulcerations were increasing in number. Healing was finally accomplished by drilling 18 holes about 1 cm. in diameter through the calvarium to the dura. The drilled holes were made at the site of the ulcers, and were irrigated with Dakin's solution. Healthy granulations soon appeared, and better vascularization of the scalp was thus obtained.

Judging by the cases referred to in this communication, secondary breaking down in the healed areas after skin-grafting is very common. Probably the

Wolfe-Krause grafts, which take the whole thickness of the skin, are the most satisfactory.

One hundred and sixty-two cases of avulsion of the scalp are mentioned in the paper. In some it was possible to replace the scalp with a good result, but in others it sloughed, and grafts had to be employed.

REFERENCE.—[1]*Boston Med. and Surg. Jour.* 1922, June 1, 727.

## SCARLET FEVER.

*J. D. Rolleston, M.D.*

EPIDEMIOLOGY.—R. Nielsen,[1] who has investigated the incidence of scarlet fever in Denmark since 1877, concludes that the decline in frequency of the disease is slight and even doubtful. Scarlet fever is less frequent in children under 5 years, owing to more effective isolation of the cases among school children. A comparison of the incidence of scarlet fever in Copenhagen, provincial towns, and country districts, showed that it was directly proportional to the density of population. The mortality was about 14 per cent in the first year of life, 4·5 per cent in the period 1 to 5, and only 2 per cent after the fifth year. During epidemics the older children were the first to fall ill, and it was only towards the end of an epidemic that an appreciable number of children under 5 contracted the disease. The incidence of the disease was least in the summer, and greatest in the autumn and winter, but the months of maximum and minimum incidence varied from year to year.

SYMPTOMS AND COMPLICATIONS.—R. Bloch[2] reports a case of *surgical scarlet fever* in an infant, age 18 months, caused by sucking its thumb, as the result of which a septic lesion had developed. The scarlatinal eruption first appeared at the site of the lesion, spread up the arm to the trunk, and soon became generalized, being accompanied by tonsillitis and submaxillary adenitis. Bloch recommends that every wound, even an apparently trivial breach of surface caused by sucking, should be regarded as a possible portal of entry for scarlatinal infection.

M. Gonnella[3] examined the urine of 16 cases of scarlet fever in children, 5 of whom were boys and 11 girls, to determine whether *desquamation of the bladder-cells* takes place in an analogous manner to that of the skin. He found that with three exceptions there was a decided increase in the number of epithelial cells in the urine, an increase which was not found in the urine of children suffering from other infectious diseases, such as typhoid, pneumonia, and influenza. The two phenomena, however, of desquamation of the skin and desquamation of the bladder did not bear a close relationship to one another, as in two instances children who showed very pronounced desquamation of the skin had only a few epithelial cells in the urine.

According to Medi,[4] who reports a case in a child, age 2½, of *suppurative orchitis* which developed on the eighth day of disease, only three previous examples of orchitis in scarlet fever have been published. None of the previous cases, however, ended in suppuration.

E. C. Dunham[5] has collected 10 cases of *peritonitis* complicating scarlet fever, including a personal case in a five-year-old girl who recovered after operation. In 2 cases the peritonitis developed in the eruptive period, one being fatal, and in 2 cases during desquamation, with one death, while in the rest the time of onset is not stated. The diagnosis was confirmed by operation or necropsy in 4 cases. In 2 cases a streptococcus was grown from the pus. The peritoneum is probably infected from the blood-stream, but no blood-cultures have been reported in any of these cases.

In addition to the 16 cases of *purpura fulminans* following scarlet fever collected by J. D. Rolleston and T. McCririck in 1910, G. McConnell and H. L. Weaver[6] have collected 7 examples of this rare sequela, including the following personal case. The patient was a girl of 6, who on the fifteenth day after the onset of scarlet fever, and on the seventh or eighth day of normal temperature, developed a temperature of 104° and discoloration of the left foot. In the next twenty-four hours ecchymoses appeared on the body. The urine and stools became bloody, and on the fourth day after the appearance of the first ecchymosis death took place. At the autopsy hæmorrhages were found in the bladder, intestine, and brain. Microscopical examination showed that the discoloration was not due to gangrene, but to interstitial hæmorrhage following infectious thrombosis.

*The Blood.*—E. Fraenkel's[7] examination of the blood in scarlet fever confirms the observations of Naegeli and other observers. A fall in the number of red cells to 3½ or 4 million, indicating a toxic lesion, was occasionally found in the early stage or as the result of scarlatinal nephritis. Leucocytosis was also an early phenomenon, and of value in the differential diagnosis. The number of white cells was generally raised, although in exceptional cases low values between 4000 and 7000 might be encountered. As a general rule the number of white cells in the first three days ranged between 10,000 and 18,000. The highest number registered was between 25,000 and 29,000, which was met with in severe cases. In the subsequent course of the disease these numbers fell, unless there was a relapse or a mixed infection with streptococci. In exceptional cases an eosinophilia of from 6 to 10 per cent was observed as early as the second day, but as a rule the number of eosinophils at this time was low (0 to 1 per cent), and it was only later that it rose. Eosinophilia occurred earlier and was more marked in mild cases with a faint eruption than in severe cases in which the rash was well developed. The highest values observed were 17 to 22 per cent on the fourth to seventh day in mild cases, and in one instance—in which the desquamation was profuse—30 per cent on the twenty-second day.

DIAGNOSIS.—E. W. Goodall[8] does not regard a peeling case as one of scarlet fever unless there has been a preceding illness in which a sore throat and rash were symptoms. Although some authorities consider pinhole desquamation as characteristic of scarlet fever, it may occur after measles, rubella, urticaria, serum rashes, quinine rash, and the rash caused by such irritants as camphorated oil.

PROPHYLAXIS.—R. Degkwitz[9] advocates the same prophylactic method as in measles, viz., injection of **Convalescents' Serum.** Of 509 cases so treated, all but 3 who had mild attacks escaped the disease. The dose consisted of 5 to 6 c.c. for children up to the age of 8, and of 10 c.c. for those of ages 9 to 14. F. C. Neff[10] has used this method in 25 cases without any failure or untoward result. Owing to the shortness of the incubation period the serum should be injected as soon as possible when exposure to infection is likely. The protection conferred lasts only a few weeks.

TREATMENT.—G. H. Weaver[11] treated 54 cases of scarlet fever with **Immune Human Serum.** All the cases were severe, 38 being of the toxic type, 6 characterized by septic complications, and 10 showing a combination of toxic symptoms and septic complications. The blood was taken from convalescents during the fourth or early in the fifth week of an uncomplicated attack who were free from any suspicion of tuberculosis and whose Wassermann reaction was negative. After the serum had separated from the clot, it was drawn off, mixed with serum from two or three other patients, and 0·3 per cent of tricresol added. Intramuscular injections of 60 to 90 c.c. were given, half of the amount being injected into each thigh. The dose was repeated if there was no obvious improvement in twenty-four hours. With the exception of two cases in which no appreciable benefit ensued, the treatment was invariably successful, the injections being rapidly followed by an immediate improvement in the general condition, and later by a fall of temperature. Good results are also reported by Bode[12] from the use of convalescent serum. The effect on the temperature was pronounced in all the 30 cases in which he employed this method, but the eruption was not modified, nor were complications prevented.

K. Salomonsen[13] deprecates expectant treatment in scarlatinal otitis, his procedure being as follows: As soon as signs of retention occur, paracentesis is performed, and is followed by instillation with hydrogen peroxide and careful irrigation with tepid water, paracentesis being repeated when the first opening becomes closed. A radical operation is performed as soon as definite tenderness and infiltration of the mastoid are observed or the temperature assumes an irregular course. A third indication for opening up the mastoid process is persistence of a discharge from the ear for more than six to eight weeks. Salomonsen regards an early radical operation under general anæsthesia as a far more conservative measure than a subsequent series of incisions. probings, and scrapings of a peri-auricular abscess without general anæsthesia.

REFERENCES.—[1]*Med. Science*, 1922, vi, 443; [2]*Münch. med. Woch.* 1921, 1679; [3]*Deut. med. Woch.* 1922, 426; [4]*Policlinico*, 1922 (*Sez. Prat.*), 155; [5]*Amer. Jour. Dis. Child.* 1921, ii, 307; [6]*Jour. Amer. Med. Assoc.* 1922, i, 165; [7]*Zeits. f. ärtz. Fortbild.* 1922, 140; [8]*Med. Press and Circ.* 1922, i, 235; [9]*Münch. med. Woch.* 1922, 955; [10]*Arch. of Pediatrics*, 1922, 250; [11]*Jour. Amer. Med. Assoc.* 1921, ii, 1420; [12]*Ibid.* 237; [13]*Med. Science*, 1922, vi, 448.

## SCIATICA.

*J. Ramsay Hunt, M.D.*

Some recent Scandinavian investigations on the pathogenesis of sciatica are given by Hans Jansen.[1] Of late years there has been a tendency to look upon the neuralgias as forms of neuritis; that is to say, it is presumed there is in all these diseases an inflammatory condition in the nerve or in its sheath. K. A. Petrén in particular has supported this view in the *Scandinavian Textbook of Medicine*, 1916. On the other hand, Wertheim Salomonson and Oppenheim continue to regard neuralgia as a purely functional irritation of the nerve without demonstrable anatomical changes. This view is also held with regard to sciatica. Petrén previously explained in a similar way certain cases of sciatica, in which he found myositis (or at any rate spasm) in the deep gluteal muscles, and he thought that this condition alone might possibly cause sciatica by pressure on the sciatic nerve. This muscular origin of sciatica is discussed in Kleen's handbook on massage, and is well known to all masseurs and doctors skilled in that subject.

There are many important objections to this theory. In the first place, Helweg has not brought any incontestable proof that the disease is not situated in the nerve, or at any rate implicates it. Folke Lindstedt, a teacher at the Koroline Institute in Stockholm, has published some papers on sciatica in the last few years, in which he supports the following view: Sciatica, in the large majority of cases, is a pure neuralgia, a functional disease without anatomical findings in the nerve. It arises from the presence of painful or merely irritating conditions in the periphery of the nerve which cause pain radiating into the whole of the sciatica area in the same way that toothache can produce trigeminal neuralgia. The irritation must have a certain amount of persistence or strength, and the person must have a susceptibility to neuralgia. If the susceptibility, 'the neuralgic disposition', is great—in other words, if the individual is markedly neurasthenic—the 'irritamentum' need only be trifling.

In an investigation of 100 cases of sciatica, Lindstedt claims to have found the irritamentum in 91, as follows: tumours in 3 patients; lesions of the spinal column, 8; salpingitis, 2; appendicitis, 1; chronic arthritis of the hip-joint, 9; acute ditto, 2; fracture of the femur, 2; trauma of the knee-joint, 11 (often many years back); chronic arthritis of the knee-joint, 3; genu valgum, varum, or recurvatum (total), 8; trauma of the feet, 5 (often many years ago); flat-foot (insufficientia pedis), 11; polyarthritis, 12; varicose veins, 8; infantile paralysis, 1; constitutional weakness, 3; septic affections, 2. As a rule these diseases do not exert their irritation directly, but through causation of muscle contractures and static abnormalities.

Ideas of a similar nature are held by Ljungdahl. But there is this difference. Ljungdahl only deals with sciatic pain in spondylitis deformans and osteo-arthritis deformans coxæ. The hypothesis is this: The pain is a reflex phenomenon similar to Mackenzie's viscero-sensory reflex. What gives rise to the reflex is the early destruction in the diseased portion of the bone or cartilage. He regards the conditions as traumata, threatening the tissues with destruction or breaking down. The pain is the patient's signal of distress; the simultaneous contractures in the surrounding muscles are similarly the self-defence of the organism, analogous to Mackenzie's viscero-motor reflex. Sciatica, therefore, is a symptom-complex which can arise under the most diverse circumstances. There is certainly a group of neuritic sciaticas. It comprises the following: cases where the nerve fibres themselves are affected; alcoholic and lead neuritis especially localized in the sciatic nerve; the not uncommon sciatic neuritis in diabetes, which can only be cured by an appropriate diet; herpes zoster neuralgia in the sciatic nerve, in which, of course, there is affection of the spinal ganglia—probably a number of cases of influenzal and malarial neuralgia (and neuritis) also belong to this class; lastly, malignant growths in nerves. There is another group in which direct pressure upon the nerve-trunk or its roots is just as good an explanation as that of referred or reflex phenomena, such as the ordinary sciatic pains of pregnancy, sciatica with benign and circumscribed malignant tumours of the pelvis, deep abscesses, hæmatomata, abundant formation of callus after fracture, etc. There are also cases in which the theory adopted by Lindstedt is the most probable. Flat-foot and similar static abnormalities in the lower extremity can undoubtedly cause sciatica. Here again the route is doubtless via the muscles. Lastly, there are the sciatica-like pains often met with in osteo-arthritis deformans coxæ and spondylitis deformans—particularly in the early stages.

There are still many cases of sciatica which do not fall into the above categories. These are consequent upon traumatic lumbago. Ordinary uncomplicated sciatica is a benign disease which of itself tends to get well. When it appears to be chronic, it is either because it is secondary to one of the many cited chronic complaints, or because it has produced a kind of traumatic neurosis in the patient.

### The Surgical Treatment of Chronic Sciatica.

While the majority of cases can be cured by medical means, there are still a certain number where medical treatment fails. In these the patients are usually almost completely incapacitated by their pain, and if it is not relieved they tend to drift into a condition of chronic invalidism. J. Mill Renton[2] is satisfied that in a considerable proportion of these cases a rapid and complete recovery can be obtained by operation. The benefits of surgical treatment have not been as widely recognized as they might be, for two reasons, viz., a lack of appreciation of the type of case suitable for operation, and the performance of an unsatisfactory operation, namely, nerve-stretching. If the correct type of case is selected, and the operation of nerve-freeing performed, a cure can be obtained in practically every instance.

The chronic cases may be roughly classified into three groups: (1) Cases where the patient is quite free from pain while at rest, but begins to have pain on exercise or on assuming some special position ; (2) Cases which have a certain amount of pain while at rest, but where it becomes really intense on exercise or on the assumption of a particular position ; (3) Cases where the pain is of an indefinite character—present at rest, off and on, and sometimes improving to a certain extent on exercise. In the first type the pathology of the condition is quite definite. The inflammation of the nerve has subsided, but adhesions have been left round the nerve as a result of a perineuritis. These vary from fine adhesions to definite bands, strong enough in some cases to draw the nerve out of its normal position. In the second type one has the same condition of adhesions round the nerve, but in addition one presumes there is a varying amount of inflammation of the nerve itself still present. In some instances this may be kept up by the pull of the adhesions, especially where the patient has been trying to move about. In the third type the pathology is not at all clear, and in the only case where Renton operated the nerve appeared quite normal. This type seems to be quite unsuitable for surgical treatment.

It is not possible to give records of a very large series of cases, as the operation is only indicated in a limited number of patients. Crawford Renton has recorded 32 cases of operation, extending over a period of thirteen years, and all of these were cured or rendered well enough to return to active life. The author has operated on 10 cases—6 of these were of type 1, and all of them recovered completely ; 3 were of type 2, and of these 2 made a complete recovery ; the third, although greatly improved and able to return to active work, still complained of some pain and numbness of his foot a year later. One case was of type 3 ; no adhesions were found, and naturally no benefit followed the operation.

Renton concludes that cases of sciatica which are free from pain while at rest, but where the pain commences on exercise, can certainly be cured by operation. Cases where there is a certain amount of pain while at rest, but where it becomes much more severe on exercise, can usually be cured, or at any rate greatly improved, by operation. The procedure consists in the freeing of the sciatic nerve from adhesions, and not merely in nerve-stretching.

REFERENCES.—[1]*Lancet*, 1921, ii, 737 ; [2]*Glasgow Med. Jour.* 1921, Aug., 106.

## SCLERODERMIA. *E. Graham Little, M.D., F.R.C.P.*

Kingery[1] reports a case which appeared to follow a nerve injury in the area of an extracted tooth. The patient was a medical student, age 26, with an apical abscess at the root of a tooth, which was excised. Three weeks after the extraction a patch developed on the cheek, opposite the site of the tooth, which proved to be sclerodermia. Sections were made from the affected skin, and the diagnosis of sclerodermia confirmed.

REFERENCE.—[1]*Arch. of Dermatol. and Syph.* 1922, May, 579.

## SENILITY. *Herbert French, M.D., F.R.C.P.*

The amount of attention that is devoted to the question of old age is far greater in the lay press than it is in the medical journals, but it is evident that the matter is one of great interest to everyone. Almost daily in the papers we read interviews with centenarians, and their descriptions of their mode of life and diet to which they ascribe their having survived a hundred years or so. Unfortunately for the teetotallers, the honours are about easy between those who indulge in alcoholic beverages and those who do not, and the same applies to tobacco. Some eat little or no meat, but an equal number would appear to indulge heartily in all kinds of foodstuffs. Thompson and Todd[1] have an interesting article on senility as observed by them during the period that they have been in medical charge of the pensioners in the hospital at Chelsea. They are not able to give many data bearing on the factors which conduce to longevity. They do not attach much importance to the alcoholic and tobacco question. As regards diet, they remark on the fact that old men eat enormously as a rule.

The definition of old age itself is a difficult one, as the total of years is not the standard by which old age can be assessed. Some men are old when they are sixty, while others are physically and mentally active at eighty, and they draw a distinction between senescence and senility. Senescence is physiological old age due to the natural physical deterioration of the body from long use. Senility, on the other hand, is morbid old age which is due to the addition of lowered mentality to the normal physical deterioration. They lay emphasis on the fact that the chief factors in senility are the psychic changes—the lapsing sympathetic control, and the loss of balance between the sympathetic and the parasympathetic system. There is no question that this is very largely brought about by unwise treatment from the family and friends. "Many old people are easily persuaded to take a morbid interest in being helpless, and soon learn to enjoy being the coddled centre of attraction, a subject for commiseration and mistaken sympathy, which finally produce a self-centred abstraction so common among the aged." Old people are often kept in bed unnecessarily, and there can be no doubt that so far as is possible they should be kept out of bed. As long as a man is capable of responding to the stimuli of self-reliance, the instinct of self-preservation and self-respect, he cannot be said to suffer from old age. These are golden rules for the treatment of old people, and it seems a pity that they cannot be brought home to all who have the care of old people, and indeed to everyone. Old age would thus be rendered less unpleasant, and much tyranny by the aged, and slavery of their attendants, be avoided.

A year or so ago 'monkey gland' was given great prominence in the columns of the daily newspapers, and must have led to much disappointment among elderly gallants who sought to embrace this opportunity of outrivalling Dr. Faustus without having to pay his heavy penalty.

Prominence has been given of late to Steinach's operation in premature senility. This consists in ligation of the vas deferens. The rationale of the process depends upon the two-fold function of the testis. The first function is, of course, spermatogenesis. The second is the manufacture of the internal secretion which undoubtedly furnishes the secondary sex characteristics of the individual. This is the function of the interstitial gland, a collection of minute structures, not unlike fatty globules, situated in the connective tissue of the testicle, separate from and unconnected with the vesiculæ seminales and vas deferens. When this interstitial tissue degenerates, the characteristic symptoms of senility appear in the individual affected; but if by any means spermatogenesis can be inhibited, it is found that a compensatory regeneration of interstitial tissue occurs. Stimulation of the production of the internal secretion of this interstitial tissue thereupon results and brings about a rejuvenating effect on the body.

Marinesco[2] describes the effect of this operation on animals, and gives a section of the testicle of an old cat after ligature of the vas which shows degeneration and atrophy of the tubules, accompanied by active multiplication of the interstitial cells. He describes the beneficial effect of the operation upon two cases of Parkinson's disease, and another case who was suffering from an advanced stage of locomotor ataxy. None the less, in this article he gives his opinion that the phenomena which occur after the Steinach operation cannot be designated as rejuvenation.

In the *Lancet*[3] is given an extract from an article in the *Wiener klinische Wochenschrift* in which Professor Zeisse describes with praiseworthy candour the details of a Steinach operation on himself. He had been suffering from enlarged prostate and bilateral epididymitis, and was tired of catheter life. Section of both vasa deferentia was performed, but produced no diminution in the size of the prostate, nor any improvement in spontaneous micturition. Sexually there was a decrease rather than an increase in activity, and there was no alteration in his mental or physical condition.

Thyroid gland is undoubtedly of service in the case of many people who seem to be congenitally deficient of thyroid secretion. It raises the temperature, increases the pulse-rate, and there are a number of patients who feel invigorated by a daily small dose of thyroid gland substance. Many of their functions are restored to normal; among these may be mentioned the sexual function. Scott[4] advocates the administration of thyroid gland and anterior pituitary substance in the majority of the aged in whom blood-pressure is raised. He advises ⅔ gr. of thyroid, combined with ¾ to 1 gr. of anterior pituitary substance, three times a day taken before meals. In the rarer senile cases with lowered blood-pressure, he advises that suprarenal substance should be combined with the anterior pituitary, 2 gr. of the first and 1 gr. of the second being given. He has seen cases of senile epilepsy which have been much benefited by this.

It is, however, very difficult indeed to draw any practical conclusions with confidence from amongst the multitude of papers dealing with endocrinology, whether dealing with the wider aspects of the entire subject or with its particular relationships to the phenomena of old age.

REFERENCES.—[1]*Lancet*, 1922, i, 874; [2]*Presse méd.* 1922, April 12, 309; [3]*Lancet*, 1922, ii, 1154; [4]*N. Y. Med. Jour.* 1922, April 5, 431.

## SERUM SICKNESS. *J. D. Rolleston, M.D.*

G. Blechmann and G. Stiassnie[1] deal with a symptom of serum sickness which has not previously been described, viz., *orchitis*. Their patient, age 6½, had been treated with large doses of serum for a severe attack of diphtheria. During the serum rash an extremely painful bilateral orchi-epididymitis developed. As the rash faded and the other symptoms of the serum disease, such as fever, joint pains, and adenitis, subsided, the scrotum diminished in size and the pain disappeared. F. Carrieu[2] reports a similar case of bilateral orchitis which occurred at the time of the serum rash and joint pains in a boy of 14 who had been treated with antitoxin for diphtheria. The orchitis subsided about six days after disappearance of the other serum manifestations. All other causes of orchitis, especially tuberculosis and gonorrhœa, could be excluded.

PROPHYLAXIS.—The employment of immune ox serum in the prophylaxis and treatment of diphtheria and tetanus is advocated by R. Kraus,[3] who found that serum sickness was much less frequent after injection of serum obtained from immunized oxen than after that obtained from immunized horses.

REFERENCES.—[1]*Arch. de Méd. des Enf.* 1921, 744; [2]*Ibid.* 1922, 230; [3]*Münch. med. Woch.* 1922, 204.

## SHELL SHOCK. (*See* PSYCHOLOGICAL MEDICINE.)

## SKIN DISEASES, GENERAL. *E. Graham Little, M.D., F.R.C.P.*

### SKIN DISEASES IN PENSIONERS.

This subject, of much practical importance at the present time, is dealt with by MacCormac,[1] who suggests a classification in three groups: (1) Definitely due to war service; (2) Questionable whether caused by or aggravated by war service ; (3) Not due to war service. In the first group he would include cases of parasitic infection, sycosis, and tubercle of the skin. In the second class the author lays it down as 'just' that if the disease arose during war service it may be attributed to it, a claim which seems rather extravagant in conditions such as eczema, lichen planus, and psoriasis, instances which he cites. All forms of seborrhœa were made worse by war conditions, and should be certainly included ; but he oddly excludes acne vulgaris, which he ranks in the third category as uninfluenced by war. The third group is largely composed of self-inflicted or self-aggravated eruptions, the cause of which can usually be detected by observation in hospital.

## ETIOLOGY OF SKIN DISEASES.

Whitfield,[2] in his valuable Lumleian Lectures with this title, covers a field too large for full abstraction in the space at our disposal. Only a few of his opinions can be touched on here. Eczema he regards as purely a reaction to external irritants, and, whether this dictum be accepted or not, he renders useful service in insisting on meticulous care in investigating the possibility of a direct causation in every case of eczema. Chemical and botanical agencies are very fully considered, and parasitic disease simulating eczema, notably ringworm, receives due attention. Under the heading of internal factors he deals fully with sensitization, which has received so much attention in the past year everywhere. He distinguishes between autosensitization and foreign sensitization, and under the first heading gives some very interesting examples of apparent extension of eczematoid eruption from absorption of non-bacterial toxin from damaged tissue, e.g., from an aseptic hæmatoma ; and he attributes the spread of an exudative eczema to the direct irritant effect of the discharge on the patient's skin, such discharge not being pathogenic to other persons. Foreign protein sensitization is a larger field, and instances of egg sensitization, and other types, are given. Indicanuria is frequently regarded as an indication of intestinal toxæmia. The author examines this position, and states that he has found indicanuria frequently in lupus erythematosus, irregular erythema, pruritus without lesions, obstinate acne, and occasionally in psoriasis. When indican is excessive, **Creasote** is an excellent treatment.

He examines the claims of Danysz' injections, and records his own failure with this form of treatment, and he protests against the assumption that the vaccine treatment inaugurated by Wright depends on no kind of specific-immunity reaction. Focal infection the author defines as " the causation of various symptoms by the absorption of toxin from one or more infected areas ", and he considers it under two headings : (1) Infection from the skin itself (examples offered of which are secondary eruptions in pediculosis capitis, and in deep trichophytic infections as studied by Bloch, of Zurich) ; and (2) The more common cause, deeper sepsis, the gums, teeth, tonsils, and accessory sinuses of the nose being the sites most commonly incriminated.

He lays down the following admirable postulates which should guide the practitioner in making up his mind as to the part to be attributed to focal sepsis : (1) That the skin disease shall be chronic or frequently recurring ; (2) That no other cause shall be found ; (3) That the usual methods of treatment shall be found unavailing ; (4) That appropriate treatment of the teeth and gums shall be followed by cure, or at least marked improvement. The last etiological factor to be considered is the association of neuroses with skin disease. In this category the group of artefact eruptions is considered, some of which are deliberate attempts at fraud ; but many are true psychoses, and the nervous alopecias common during the air raids are cited as instances of this causation. Another form of alopecia ascribed to reflex nerve disturbance has long been insisted upon, principally by Jacquet, and the author cites some cases associated with eye-strain.

*Cutaneous Sensitization and Focal Sepsis in Etiology.*—This subject was discussed at the meeting of the British Medical Association held in Newcastle.[3] Barber, in the opening paper, reviews the literature, which is largely American, and confirms the opinion that the special sensitizations are frequently inherited ; and, perhaps less often, there is a susceptibility generally to proteins, not necessarily the same. The reactions also may be different in different members of a family, one having hay fever, one 'eczema', one urticaria, etc. Non-protein substances, e.g., quinine, may also have their victims, who behave very much like the subjects of protein ingestion, and thus imitate a true anaphylaxis. Cutaneous tests are very valuable, if too much is not expected from them. Local susceptibility may be conferred by repeated stimuli in the same position ; e.g., von Pirquet found that his left arm, which he habitually used for experiments with tuberculin, was sensitized to dilutions at least ten times weaker than the dose which would produce a similar result on his right arm. Focal sepsis, the second heading of the discussion, is defined as a "chronic infection of some region of the body, the local resistance of the tissues being inadequate, so that bacteria are capable of active growth, and of producing therefore toxins which are absorbed into the system, and of themselves passing into the blood-stream". The commonest foci are the teeth, tonsils, nasopharynx, and nasal sinuses, and possibly the intestines. Other possible foci are named, the most important to the dermatologist being the skin itself.

The greater part of the paper is devoted to considering individual clinical diseases which, in the author's opinion, are definitely associated with protein sensitization and focal sepsis. The erythema-urticaria-purpura group of eruptive disease is naturally the type most often found with this association, and streptococcic infection is the commonest met with. The author groups herpes zoster, herpes catarrhalis, and herpes genitalis as similar manifestations of probably bacterial infection acting on different portions of the nervous system, and narrates a most astonishing case in which numerous recurrent attacks of supra-orbital herpes zoster resulted from injections of a vaccine prepared from the patient's septic tonsils. Eczema is considered in two relations: local sensitization to external irritants, and eczema of apparently internal origin. Infantile eczema may be divided into two classes: a true seborrhœic eczema with secondary impetiginization, and an exudative type commonly due to protein sensitization, such as, e.g., from foodstuffs. Bacterial sensitization is much less common in children than in adults. In the latter, oral sepsis is by far the most usual cause. Lupus erythematosus the author found most often in association with infection by streptococcus, usually in the mouth. Alopecia areata, again, the author regards as prevalently due to tonsillar sepsis, and he advocates complete enucleation in all such cases.

Cranston Low, who followed Barber in the discussion, quoted some interesting personal experiments on his own skin with *Primula obconica,* to which he was at first immune, but with repeated applications he broke down that immunity. In this author's view the skin-cells themselves become sensitized, and may show this sensitization even when transplanted to another person. Dermatitis herpetiformis and prurigo of Hebra are probably to be included in the list of diseases due to anaphylaxis.

*Chemistry of the Body in Relation to Diseases of the Skin.*—Levin and Kahn[1] examine some claims that have been made to connect certain dermatoses with changes in the chemistry of the body. In eczema, on an examination of 42 cases, the author found acidosis in 6, 4 of whom had diabetes, 1 furunculosis, and 1 Hodgkin's disease. The acidosis was clearly explicable by conditions other than eczema, and only in 4 cases of uncomplicated eczema did they find even a mild acidosis. In diffuse eczema in some instances the authors found a marked increase in the ethereal sulphates in the urine, pointing to an intestinal putrefaction. With this exception, the blood chemistry in eczema was apparently normal. In acne vulgaris there is a slight increase in blood sugar, a slight acidosis, but no increase in calcium content as stated by Thro and Ehn.

The non-protein sulphur of the blood was increased in some cases of psoriasis, and in this disease there is often a slight acidosis. In one case of xanthoma there was a marked increase of blood cholesterol.

*Intestinal Stasis: Skin Associations.*—Arbuthnot Lane[5] notes as the most marked change in the skin the staining about areas exposed to friction, e.g., neck, spine, axillæ, groins, and genitals. When stasis is relieved by colectomy, this pigmentaton disappears. Sweating is also abundant and malodorous. Hair is apt to grow in abnormal places, especially in women; and baldness is often an early symptom. Wrinkling of the skin, due to wasting of fat as a result of auto-intoxication, with puffiness of the eyelids, is common. The temperature of the skin is subnormal, and an abrupt decrease in heat is noticeable in the extremities. The nose and ears are cold and blue, chilblains are frequent, and the skin of the limbs rough and covered by papules. Local infections of the skin are very frequent. All these accompaniments, the author declares, are removed by colectomy.

*Skin Reactions in Dental Sepsis.*—Semon[6] describes five cases of varying cutaneous type with the common factor of dental sepsis. The first case was general pruritus, in a woman of 62. The teeth did not show clinical symptoms of disorder, but $x$ rays revealed apical abscesses at the root of several, and eight teeth were extracted. *Streptococcus hæmolyticus* was identified in the root abscess, and a vaccine prepared from it was given, with great benefit. Two more teeth became infected and were removed later, and the symptoms, which had recurred with the sepsis, disappeared with extraction. The second was a case of erythema multiforme type, with pronounced oral sepsis and fœtor. All the teeth were removed, and a culture of *Streptococcus viridans* was grown from the teeth. Vaccine treatment was highly successful. The third case was a chronic urticaria. All the teeth were extracted, and a culture of a short-chained streptococcus was obtained from the predominating organism present. Complete recovery resulted. The fourth case was also chronic urticaria. A septic stump seemed the exciting cause, and on its removal *Str. viridans* was found in the root; vaccine prepared from it produced material improvement but not entire cure. The fifth case was one of furunculosis extending over four years. Three gold-crowned teeth were all that she had left, and these proved on $x$-ray examination to be septic, and were removed. The predominating organism was *Str. viridans*, and a vaccine not only cleared up the furunculosis, but greatly improved the general health.

*Focal Infection in Skin Disease.*—Leslie Roberts[7] has a very philosophical paper on this much-discussed subject. He considers only the type of focal infection in which there is a collection of bacteria in a crypt or pocket (such as occurs in the tonsil) which, while not actively growing, may infect the body by their cell substance, which is liberated by the action of ferments or enzymes either by self-digestion (autolysis), or by the enzymes of the cells of the invaded tissue (heterolysis).

The author considers that the common flora of the tonsils and mouth, the hæmolytic and non-hæmolytic streptococci and staphylococci, may serve a useful purpose in digestion in much the same way as intestinal bacilli act. Following Kelly, he thinks there is an analogy between the tonsil and tne vermiform appendix, and this proposition is worked out in detail, for which the original paper must be consulted.

Our food consists of foreign proteins, carbohydrates, and fats, and it is essential for the welfare of the body that these should not be allowed to pass through the wall of the intestines into the interior without first being deprived of their toxicity. There exists in the body an organized system of defence against foreign proteins. The first line is taken by the cells of the mucosa of the stomach and the higher intestines, the second line by the bacteria of the colon, and the third line by the free moving cells of the lymphoid tissues.

The experimental parenteral introduction of foreign proteins into animals has shown that the complete protein molecule is a violent poison. Its first introduction into a perfectly normal animal may be followed, if the dose be sublethal, by no very remarkable symptoms; but the second injection of the same protein after an interval of some eight days provokes violent symptoms, which may end fatally in a few minutes. This fact is best explained by the assumption that the foreign protein in the blood evokes the development of an unusual digestive ferment in the cells of the body, and when the mechanism of this heterotopic digestion is once formed, the cell henceforth is sensitized to the particular foreign protein which evoked the proteolytic function. All foreign proteins, whether they be animal, plant, or bacterial, are sensitizers. Bacterial vaccines are protein sensitizers.

To this state of protein sensitization Richet gave the name of anaphylaxis; von Pirquet proposed the name 'allergy', which etymologically means 'altered reactivity'. Pathological symptoms accompany this sensitization; the blood-forming organs are specially affected, and anæmia, leucopenia, and eosinophilia appear. When the skin-cells are sensitized in cases of chronic allergy, various symptoms arise—loss of hair, either diffuse or in area, forms one of the commonest; also increased pigmentation and increased fat formation; in short, we have evident signs of stasis in the cutaneous tissues. Other clinical forms of disease are lupus erythematosus, lichen planus, and prurigo, the erythematosus group of diseases, especially erythema multiforme and erythema nodosum, dermatitis herpetiformis, some forms of eczema (but probably a minority of these). In all of these protein sensitization probably plays a predominant part.

REFERENCES.—[1]*Brit. Med. Jour.* 1921, ii, 561; [2]*Lancet*, 1921, ii, 61, 122, and 168; [3]*Brit. Med. Jour.* 1921, ii, 551; [4]*Amer. Jour. Med. Sci.* 1921, Nov., 698; [5]*Med. Press*, 1921, Oct. 26, 336; [6]*Lancet*, 1922, i, 889; [7]*Brit. Med. Jour.* 1921, i, 262.

## SKIN DISEASES, GENERAL THERAPEUTICS.

*E. Graham Little, M.D., F.R.C.P.*

Sabouraud[1] warns against the too frequent use of alkalis in the washing of the hair, especially when it begins to show signs of splitting at the ends, a symptom caused by the alkali itself. In washing the head the surface of the scalp should be the first object of the cleansing, and not the hair, a point frequently forgotten by hairdressers. Soapy washes are necessary in certain states of the scalp, when the hair is rapidly falling from a seborrhœa; but the wash in these instances should be with soap as free from superfluous alkali as possible, the scalp should be carefully rinsed with distilled or rain-water, and it is prudent to add a weak acid, such as lemon-juice, to remove all trace of alkali. Fine silky hair should have no soap on it at all. For such hair a shampoo of three yolks of eggs beaten up with a tumbler of hot water and strained, is preferable, and the scalp should be quickly rinsed and dried. For a hair tonic free from risk the following is recommended:—

| | | | | |
|---|---|---|---|---|
| ℞ | Nitrate of Potash | 0·5 grm. | Alcohol | 270 c.c. |
| | Distilled Water | 30 grm. | | |

Sabouraud[2] has a characteristically practical article on the principles of treatment to be observed in groups of skin conditions. **Sulphur** is the best all-round remedy in follicular infections, such as *sycosis*, *Bockhardt's impetigo*, *acne*, and *folliculitis decalvans*. The formulæ he favours are these :—

| | | | |
|---|---|---|---|
| ℞ Precip. Sulphur, washed | | Distilled Water | |
| Alcohol (90 per cent) | āā 10 grm. | Rose Water | āā 50 grm. |

In a very greasy *seborrhœa*, this solution should be chosen :—

| | | | |
|---|---|---|---|
| ℞ Precipitated Sulphur, washed | 3 grm. | Carbon Tetrachloride | |
| Carbon Disulphide | 50 c.c. | Anhydrous Acetone | āā 25 c.c. |

In affections producing *thick dry scaling*, **Oil of Cade** is the selection he favours, in the formula :—

℞ Oil of Cade, Soft Paraffin, Lanolin equal parts
To make an ointment.

This mixture can form a basis to which may be added such a mordant drug as salicylic acid, resorcin, or pyrogallic acid ; on the other hand, zinc oxide can be added to modify the action.

In all *weeping diseases*, and in *impetigo of children*, **Eau d'Alibour** is an admirable application in some such formula as this :—

| | | | |
|---|---|---|---|
| ℞ Zinc Sulphate | | Spirits of Camphor | 1 grm. |
| Copper Sulphate | āā 0·5 grm. | Distilled Water | 400 c.c. |
| Tincture of Saffron | 0·1 grm. | | |

This may be followed by application of crude **Coal-tar Ointment** :—

| | | | |
|---|---|---|---|
| ℞ Coal-tar, Washed Neutral | 6 grm. | Lanolin | 6 grm. |
| Zinc Oxide | 3 grm. | Soft Paraffin | 18 grm. |

*Intertrigo* is best treated with weak **Iodine** lotion, e.g. :—

| | | | |
|---|---|---|---|
| ℞ Iodine | 0·3 grm. | Alcohol (90 per cent) | 30 grm. |

This should be briskly rubbed in daily with wool. If there are sweating accompaniments, the tar ointment prescribed above may be used as well. For parts where this solution is too irritative, **Gram's Solution** may be substituted :—

| | | | |
|---|---|---|---|
| ℞ Iodine | | Distilled Water | 1 litre |
| Potassium Iodide | āā 1 grm. | | |

**X Rays.**—Semon[3] attempts a generalization of the factors which should decide the use of *x* rays, and thinks he has found this in the axiom, "Avoid hyperæmic conditions of the skin", in which damage is likely to result from their use. Conditions accompanied by active cell growth are, on the other hand, suitable for this method as a rule. The well-established fact that *x* rays do not exercise a sterilizing effect on bacterial infections contra-indicates this measure in fungous diseases other than ringworm of the scalp, and in infective granulomata. In *eczema* the chief field for their use is in chronic old patches, and in the probably allied condition of '*névrodermite*'. In *septic folliculitis of Bockhardt* the epilating action of the rays is useful, as it is also in *sycosis barbæ*. In cases of localized infiltrated *psoriasis* it is especially useful. *Acne vulgaris* and excessive sebaceous secretion are well treated by this means. It is also recommended in *dysidrosis*. *Seborrhœic warts* in old people, and *non-venereal condylomata*, are very amenable to radiation. Common warts and corns are better dealt with otherwise ; but the *wart* of workers in tar is very liable to become malignant, and is well treated with rays. *Lichen planus* in acute phases should not be radiated, but hypertrophic patches are successfully rayed. If *epithelial tumours* are subjected to rays, complete destruction must be secured ; small doses do harm. *Keloid* should be rayed only in early stages.

**Radium.**—This abstract deals with a paper by Miescher and Guggenheim[4], who describe 46 cases of *rodent ulcer* treated with radium, in 45 of which the growth disappeared. No filter was used. Twelve were on the eyelid, and it is emphasized that no trouble with vision was caused by irradiation.

**Ung. Emolliens.**—Ruggles,[5] after numerous personal experiments to devise a softening cream for his own hands, roughened by Rochester water, strongly recommends the following formula in similar conditions, and especially for hands hardened by *x*-ray exposure :—

| | | | | |
|---|---|---|---|---|
| R | Glycerite of Starch | ʒv | Stearic Acid | gr. xlviij |
| | Zinc Oxide | gr. vj | Sodium Borate | gr. $\frac{9}{16}$ |
| | Quince Seed | gr. iss | Potassium Carbonate | gr. $\frac{6}{16}$ |
| | Hot Water | ♏xxxvj | When reaction ceases, add | |
| | | | Water | ♏cclvj |

M. Sig. : Cream. Smooth until no longer visible.

REFERENCES.—[1]*Med. Press*, 1921, Dec. 7, 471 ; [2]*Jour. de Méd. et de Chir. prat.* 1922, Feb. 25 (abst. *Practitioner*, 1922, May, 375) ; [3]*Practitioner*, 1922, April, 259 ; [4]*Jour. Amer. Med. Assoc.* 1921, Oct. 22, 1373 ; [5]*Arch. of Dermatol. and Syph.* 1922, April, 462.

## SKIN, SYNOVIAL LESIONS OF.

*E. Graham Little, M.D., F.R.C.P.*

MacKee and Andrews[1] report two cases of this rare condition. The lesion usually consists of pea-size, smooth, shiny, translucent, rounded cystic tumours, giving a sense of fluctuation, and exuding a syrupy white or brownish fluid on puncture. The swelling shows a slight shadow on a radiogram, and is plainly connected with the joint over which it lies (*Fig.* 42). **X Rays** or **Radium** are the best treatment. With the former a dose of 1 H at skin distance was given unscreened and repeated four weeks later, and the tumour entirely disappeared.

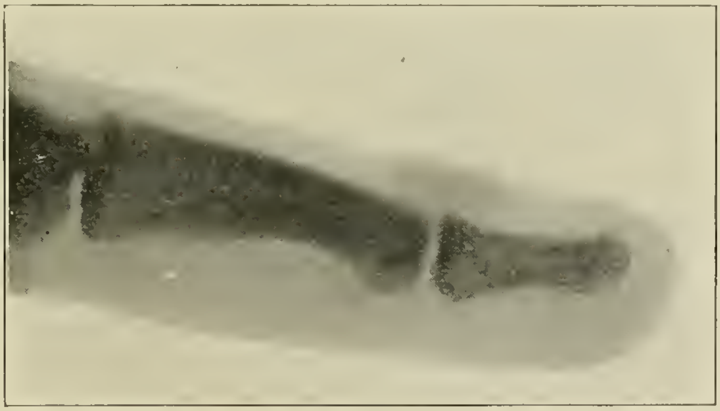


*Fig.* 42.—Röntgenogram of lesion on middle finger of the right hand.

Montgomery and Culver[2] have studied the anatomy of these lesions, and describe them as smooth, oval, prominent 'cysts' springing from the sound skin. Although having the characters of a cyst, and containing a glue-like material, it is in fact a verruca, the base of the 'cyst' having a papillomatous structure. The treatment recommended is **Radiation**—best with radium, but *x* rays may be used.

REFERENCES.—[1]*Arch. of Dermatol. and Syph.* 1921, Aug., 162 ; [2]*Ibid.* 1922, March, 329.

## SKIN, TUBERCULOSIS OF.

*E. Graham Little, M.D., F.R.C.P.*

Strassberg[1] brings forward a method of **Tuberculin** injection devised to make the most of the local cellular reaction. His argument is that when a certain quantity of tubercle bacilli is introduced into the skin of a healthy person, the bacilli may remain undisturbed and multiply *in situ* for a considerable time without any notable reaction of the body as a whole (incubation period). If the poisons produced by the bacilli are greater in amount than the body will tolerate, a reaction takes place between the poison and the skin-cells, at first non-specific in type, later specific. Probably an antibody is manufactured which acts as a katalysator, and precipitates the reaction (allergy) between the poison and the local cells. The author claims that it is useful to provoke this reaction over as wide an area as possible. He thus describes his technique:—

Hitherto he has used only 'old tuberculin' (the A.T. of German writers). A von Pirquet test is made in order to estimate the local allergic condition of the skin. The treatment is regulated according to the result of this preliminary test, which is made with decreasing strengths, concentrated A.T., and A.T. diluted 1–5 and 1–20. According to the reaction thus ascertained the dose is graduated, e.g., $\frac{1}{1000}$ mgrm. of A.T. is diluted with 10 c.c. of physiological salt solution or Ringer's solution (the latter is to be preferred, as salt solution may produce a local reaction by itself). This whole quantity of fluid mixture is distributed in injections in fifty to sixty sites, with intervals of about $2\frac{1}{2}$ cm. between each, so that in each site about 0·2 c.c. of the fluid is injected. The area chosen may be the inner surface of an upper or lower extremity, or one-half of the back. When there is a seat of disease it is better to inject round this seat in concentric rings, for in this way one makes best use of the heightened reaction in the neighbourhood of the disease. Injections are to be repeated several times in the sensitized area. The dose is made so small that in spite of considerable local reaction in the site of injection and flaming up of any diseased area, there is nevertheless no rise of temperature in twenty-four to forty-eight hours after the dose. With a very strongly positive von Pirquet, for instance, the quantity of A.T. used for injection may be only $\frac{1}{100000}$ or even $\frac{1}{1000000}$ mgrm., and this minute quantity is diluted, as before, with 10 c.c. Ringer solution. Notwithstanding the weakness of this dose the local reaction is obtained, the author explains, because the injections reinforce each other, so that although each injection by itself would probably produce no effect, the sum of fifty injections, all equally weak, achieves a very considerable result. The author contends that by splitting up the dose into so many parts over a large area we have increased many-fold both the local reaction and the production of useful antibodies. The series is to be repeated in proportion to the reaction they have caused: at four days' interval when reaction has been slight, at seven days' interval with a stronger reacton; and the dose of tuberculin may also be progressively increased in the same way, until the local disease of the skin is completely healed. If there is rise of temperature, the next dose must be smaller. If, on the other hand, there is no reaction with the first series, the dose may be at once increased tenfold, until in fact the limit of toleration is reached, as with such small doses too much caution is unnecessary.

*Tuberculosis of the skin and viscera* was under discussion at the meeting of the British Medical Association, held in Newcastle. Lancashire,[2] in an opening paper, dealt with the question how far skin tuberculosis is the forerunner of visceral infection, the reverse order of events, secondary infection of the skin from deep-seated foci, being relatively common. Evidence of secondary infection of the viscera from the skin would seem to be more common on the

Continent than in this country, English observers being agreed that the association is rare, in this sequence at least. Lancashire produces an analysis of fifty cases of lupus taken at random from his clinic. Only one had active phthisis, which was prior in time to the lupus. Four showed some evidence of old phthisis, but without bacillary confirmation.

REFERENCES.—[1] *Wien. klin. Woch.* 1922, Jan. 19, 54; [2] *Brit. Med. Jour.* 1921, ii, 551.

## SKIN, YEAST INFECTIONS OF.

*E. Graham Little, M.D., F.R.C.P.*

Greenbaum and Klauder[1] have a very useful article on this somewhat uncommon condition. The most familiar forms clinically are the varieties of thrush on the mucosa of the mouth of infants, and in the vagina of pregnant women. Although usually innocent, cases have been reported of serious effects from this fungus. In rare cases the eruption may extend in the infant to cover large parts of the body, when the clinical appearances resemble ringworm and eczema. The organism is *Oidium albicans* or a monilia. Tanner and Feuer reported a case of infection of the index finger near the nail, which resulted in an abscess from which *Endomyces albicans* was demonstrated. Engman described a yeast infection of the perineum, thighs, and breasts of a negress, and demonstrated organisms resembling both oidium and monilia. An intertrigo produced by a saccharomyces has been recorded several times, and forty-three cases have been studied and reported by Hudelo, Sartory, and Montlaur. The commonest sites were the clefts of the fingers and toes, the groin, and the perineum. Sodden skin with thick oozing secretion and intense itching are the chief symptoms. Saccharomyces and cryptococcus were the causative species. The present authors record 7 personal cases, with general resemblance to the cases noted above, but with some differences. They emphasize the strong similarity of the clinical aspect to ringworm infections in the same positions. The authors examined 150 persons with no clinical symptoms of infection; yeasts were found on the apparently normal skin in 35 cases, and showed four types of growth—three saccharomyces and one cryptococcus. Yeasts are therefore probably far more common on the normal skin than has been hitherto appreciated, and under certain conditions may become pathogenic. In the seven cases described, the interdigital spaces were in each case the site. Mild parasiticide ointments readily cure the affection.

REFERENCE.—[1] *Arch. of Dermatol. and Syph.* 1922, March, 332.

## SLIPPING RIB.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

R. Davies-Colley[1] draws attention to this condition. He says: "Slipping rib is a trivial enough complaint in itself, but it gives rise to the most irksome symptoms, and my two patients were quite incapacitated by the excruciating pain which followed any attempts to do manual work. The pain is described as of a sharp, stabbing nature, giving place after a few moments to a dull ache, which lasts for a considerable time, and may indeed, persist throughout the day, only disappearing after the night's rest. In its position at the costal margin it resembles that due to so many deeper lesions, both of the abdomen and the thorax, and I think it is quite likely that many cases occur in which such an apparently unimportant cause as a movable rib cartilage is unsuspected, and the diagnosis is missed. It was so in one of my cases; but the difficulty here was partly due to the fact that the patient, a woman, was known to have had definite abdominal disease in the past, and to the natural tendency to attribute subsequent symptoms to this disease; still, had I been acquainted before with slipping rib as a cause of abdominal pain, I think I might have arrived at a correct diagnosis somewhat sooner than I did."

"The treatment is simple, and consists in resection of the loose terminal portion of the rib cartilage. In both of my two cases this was followed by immediate and lasting relief of the symptoms."

A girl, age 17, complained of sudden acute pain in the left side whenever she bent forward or attempted to lift anything heavy. She stated that one of her ribs had been 'out of place' for some months, and on examination it was clear that the tip of the tenth left costal cartilage slipped over the lower border of the ninth rib and jutted forward beneath the skin when she flexed her body. This slipping movement of the rib was accompanied by an acute twinge of pain, which left a dull ache under the rib margin for several minutes after the rib had fallen back into place. Removal of the terminal portion of the cartilage was followed by complete relief of the symptoms.

Reference.—[1]*Brit. Med. Jour.* 1922, i, 432.

## SMALL-POX. (*See also* Alastrim; Vaccination.) *J. D. Rolleston, M.D.*

Epidemiology.—J. E. Henry[1] states that in Boston in 1702, with a population of about 7000, there were 302 deaths from small-pox, or 43 per 1000. In 1721 there were 850 deaths out of 11,000 people, or over 77 per 1000. Over 6000 had small-pox that year. These were the first two of seven severe epidemics during the eighteenth century in Boston. Natural small-pox killed from 9·5 to 34·4 per cent of its victims in Boston from 1700 to 1800, while inoculated small-pox had a fatality-rate varying from ½ to 3 per cent. Vaccination was introduced in 1800, and from 1800 to 1837, under compulsory vaccination, small-pox was almost completely controlled in Boston and Massachusetts, there being only 37 deaths from 1811 to 1837, or 2·7 deaths per 100,000 population. From 1837 to 1855, during which there was no compulsory vaccination in the State, there was a total of 1032 deaths from small-pox, or an annual rate of 46·2 per 100,000. In 1855 parents and guardians were required by law to have all children vaccinated at two years, and re-vaccinated thereafter at the order of the Mayor; but the law was poorly enforced, and from 1855 to 1873 there were 1969 deaths from small-pox in Boston, or 52·1 deaths per 100,000 annually. After 1872 the laws were strictly enforced, so that from 1872 to 1900 the total number of deaths from small-pox was 61, or 0·5 per 100,000. From 1900 to 1920 there was much agitation against vaccination, and although the vaccination laws were still generally enforced, there were 280 deaths from small-pox during this period, or a death-rate of 2 per 100,000.

H. Hunziker and H. Reese[2] describe an outbreak of small-pox which occurred at Basle between March and August, 1921. As in many previous epidemics, including the great London epidemic of 1901–2, the first case was regarded as chicken-pox. In 21 cases no patient, healthy third person, or fomites could be incriminated, and the writers came to the conclusion that flies were responsible for spreading the disease. The grounds for their belief were as follows: (1) Most of the cases without any known source of infection occurred during the very hot days in July, when there were a very large number of flies. (2) These insects can fly as far as 1½ kilometres and be conveyed still further by horses or vehicles. (3) Three weeks after the small-pox hospital had been fitted with fly-proof windows the epidemic came to an end. The writers are of opinion that several other epidemics can be explained in the same way, especially the occurrence of cases attributed by Thresh to aerial convection in the London epidemic of 1901. (*See* Medical Annual, 1903, p. 608.)

Symptoms.—Opinions are still divided as to the identity or otherwise of alastrim with small-pox, as will be seen by the papers of W. G. MacCallum and L. M. Moody,[3] V. E. Watkins,[4] and G. M. Goldsmith and W. F. M.

Loughnan.[5] According to MacCallum and Moody, who describe an epidemic of alastrim which occurred in Jamaica during 1920, the name 'alastrim' is of Brazilian origin and is derived from a Portuguese word meaning 'to spread or strew about', hence 'something spread like a mantle or cloak'. Other names, such as 'amaas', 'sanaga pox', 'Kaffir pox', or 'milk pox', have been applied in various countries to apparently the same disease. The writers consider the evidence as scarcely sufficient to warrant the statement that alastrim is a disease distinct from true small-pox, especially in view of the extraordinary variation in severity of small-pox in various epidemics. Mild cases of small-pox may show only a few scattered lesions and slight fever, while in alastrim the initial fever is high and the body is covered with pocks which are often almost confluent, and yet the patients are not very ill, the liability to secondary infections is slight, and the mortality trifling. Watkins, who believes that alastrim is a mild form of small-pox, attributes the modification of the symptoms to the fact that persons who have lived for generations in the tropics and in an environment diametrically opposed to that of temperate climates do not react to acute infections like white or black men in the north. On the other hand, Goldsmith and Loughnan consider that alastrim differs from small-pox in the following respects: (1) Vaccination against small-pox affords but slight protection from alastrim — the disease can occur after recent successful vaccination; (2) The severe lumbar pain of small-pox is absent in alastrim; (3) The secondary fever during the pustular period is very mild and may be absent in alastrim; (4) True umbilication of the scabs is not seen; (5) The very mild form which alastrim assumes in adolescents; (6) Absence of scar formation; (7) Low mortality-rate—1·5 to 2 per cent.

Alastrim differs from chicken-pox in the following points: (1) It occurs at all ages; (2) The marked tendency of the vesicles to become confluent; (3) The disease is liable to be prolonged in all its stages, and more particularly in the pustular stage, which may last as long as ten days.

TREATMENT.—F. A. Brancia,[6] who had previously obtained excellent results from its employment in measles and scarlet fever, made a systematic use of **Electric Colloid Silver** solution in small-pox in doses of 5 c.c. twice a day hypodermically. He found that it was very effective in the prodromal stage, produced considerable improvement in the vesicular stage, but had no result in the pustular stage.

J. A. K. Birchett and S. R. Lustberg[7] state that **Salol** given in doses of 10 gr. four times a day diminishes the degree of scarring owing to its antiseptic action. The best results are obtained when the drug is given in the pre-eruptive stage, but even those in whom it was not administered until after the appearance of the eruption showed less scarring than those who did not receive this treatment at all.

REFERENCES.—[1]*Boston Med. and Surg. Jour.* 1921, ii, 221; [2]*Schweiz. med. Woch.* 1922, 469; [3]*Amer. Jour. Hygiene,* 1921, 388; [4]*Med. Record,* 1921, ii, 1149; [5]*Jour. R.A.M.C.* 1921, i, 66; [6]*Policlinico (Sez. Prat.)* 1922, 121; [7]*Arch. of Dermatol. and Syph.* 1922, ii, 55.

## SMALL-POX AND ITS PREVENTION. *Joseph Priestley, B.A., M.D., D.P.H.*

A small outbreak of small-pox in the Metropolitan Borough of Poplar (workhouse), and a few sporadic cases of the disease in other Metropolitan areas and up and down the country, have been the cause of attention being drawn, practically universally, to the value of vaccination as a preventive. It is due to the daily papers, from the *Times* downwards, that this booming of vaccination has taken place, though the Ministry of Health has also been well to the front in advising this well-known preventive measure. Everybody who has had experience of the disease knows that vaccination is a sure preventive against an attack of small-pox—infantile vaccination for a period of five years (certain) and revaccination for periods of ten years (equally certain). This fact cannot be too widely known, as also its corollary, viz., that, given a well-vaccinated community (vaccinated and revaccinated as stated above), small-pox cannot break out. But where is such a well-vaccinated community to be found ? Other preventive measures must therefore be relied upon when small-pox appears, and these may be tabulated as follows : (*a*) Immediate notification ; (*b*) Prompt isolation (at hospital) ; (*c*) Efficient disinfection ; and last, but most important of all, (*d*) Careful medical inspection of all 'contacts'. This last measure cannot be too much emphasized, as upon its careful and systematic carrying out depends the stamping out of an outbreak of small-pox. Not less than fourteen days (the incubation period of small-pox) is the time during which this medical inspection must be continued, and that means not less than fourteen days from the probable last date of contact, viz., the date when the last case of small-pox had been removed to hospital and *efficient disinfection had been afterwards carried out.* To make quite sure, it is advisable in practice to extend the inspection over the period of fourteen days, viz. (say) to the sixteenth day.

The importance of knowing of *all* the cases of small-pox goes without saying. In other words, notification must be *immediate*, and, in this connection, the compulsory notification of chicken-pox is valuable—at least, if the small-pox assumes the proportions of a real outbreak. Vaccination and revaccination of 'contacts', i.e., of nurses and others acting as nurses, of medical attendants, sanitary officers and health visitors, vaccination officers and public vaccinators, of members of the infected family (and other persons living in the infected house), or of employees in infected workshops, or of scholars in infected schools, etc., naturally follow as a matter of course.

It is somewhat misleading, however, to cry out, under panic, for vaccination *only*. The other preventive measures, which are mentioned above, mean everything in dealing with an outbreak of the disease, and must, consequently, not be lost sight of—especially the careful medical inspection of *all* 'contacts' during, and over, the incubation period of the disease.

Recent official figures show that the disease has been introduced into 7 Metropolitan districts and 56 districts outside the Metropolis—a total of 800 to 900 cases during a period of several months, so that the preventive measures that are now in vogue have been well tried and are proving successful. It will not be suggested that such a satisfactory condition of affairs is due to vaccination, as the British population (outside the Army and Navy age-periods) is practically what may be termed an unvaccinated community. This statement must not be taken as reflecting in any way upon the value of vaccination as a certain preventive against small-pox. As already stated, all experience goes to show that vaccination as a protective inoculation is certain in its action, but like all inoculations requires to be repeated at certain intervals. The value is as a protective inoculation, though some experts claim that it is also a remedial or treatment inoculation. This latter value, in the opinion of the writer of this article, is slight—if not negligible. Vaccinia may run side by side in the same patient with variola ; and, in the case of a patient who has already caught the variola disease, even though the well-known premonitory symptoms and rash have not yet appeared, it naturally follows that vaccination cannot prevent the natural zymotic development of that variola disease, though the symptoms as they appear may be found to be modified or the virus attenuated ; the symptoms are there none the less, and the patient is capable of infecting others.

## SNAKE-BITE.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

R. Knowles[1] has recorded a useful summary of the investigations he carried out some time ago with Acton in India. Extensive experiments on rats indicated that the average dose of dried venom ejected by a cobra at a bite was between 172 and 211 mgrm., twelve to fifteen times a lethal dose for a man, and it might reach 40 such doses; but owing to the complicated mechanism of ejection the actual mortality was put at 40 to 50 per cent, and still less in viperine snake-bites.

Treatment.—Knowles advises **Amputation** of a bitten finger or toe in cases of bites by either of the six really lethal Indian snakes, a ligature having been first applied and the snake killed and identified. For bites in other positions, forcible subcutaneous injection of **Gold Chloride** [the value of which was shown experimentally by D. D. Cunningham in Calcutta some thirty years ago.—L. R.] at the site of the bite, which is more effective than injections of solutions of **Permanganate,** although he found such solutions more effective than cutting down and rubbing in the crystals. In the case of cobra and Russell's viper bites, 100 to 200 c.c. of the **Kasauli Antivenin** should be given intravenously, but it is useless against other venoms; **Artificial Respiration** may be of value in cobra bites, and **Calcium Lactate** may be of use in counteracting hæmorrhages from viperine bites. If these remedies are immediately available, he thinks 80 per cent of cases could be saved. **Dichloride of Palladium** has proved more efficacious than even gold chloride experimentally, and he suggests that it might be possible to make a still more active new compound of the heavy metal ion with the antivenin suitable for solution and intravenous injection.

M. M. Hazra[2] reports on 35 cases of snake-bite, mostly by non-poisonous snakes, but among the cases in which the snake was identified two were green pit vipers, which are not very poisonous; three by kraits, with recovery in two and death in the remaining case, which was not seen until nine hours after the bite; and two by cobras, with recovery. The treatment adopted was ligature, followed by injection of a solution of **Permanganate of Potash** or rubbing in the chemical after incision, the former being apparently more effective, while **Antevenin** was also injected intravenously, and in one case **Gold Chloride** was injected locally, **Adrenalin** or **Pituitrin** also being given for shock.

References.—[1]*Lancet,* 1921, ii, 177, and *Trans. Roy. Soc. Trop. Med.* 1921, xv, No. 3, 65; [2]*Ind. Med. Gaz.* 1921, Nov., 404.

## SPINAL SURGERY.

*J. Ramsay Hunt, M.D.*

### SECTION OF CORD FOR RELIEF OF PAIN.

W. E. Leighton[1] records his experience with section of the anterolateral tract of the cord for the relief of intractable pain. The problem of relieving pain arising from lesions involving the spinal cord or peripheral nervous system may try the resources of physicians and surgeons alike.

Section of the cord has been suggested as a last resort in lesions producing unbearable pain. Division of the posterior roots of the spinal cord for the relief of pain was first suggested by Dana in 1888, and Abbe was the first to report the operation. Since this time numerous root resections are on record, and, although the operation would appear theoretically sound, many failures to attain the desired result have been reported. In 1900 Mingazzini proposed the operation for gastric crises and lancinating pains of tabes; but it was not until 1908 that Foerster first reported the operation for this disease. The result of operation in a large series of cases has not been entirely satisfactory.

"In 1910, A. Schuller suggested that partial division of the spinal cord might be employed, instead of section of the posterior roots, for spasticity, either alone or with the direct cerebellar tract; the anterolateral column might be cut for gastric crises. He reported no cases in which this operation was performed, and he advised it for these two conditions."

A notable contribution to this subject was made by Spiller in 1912. He proposed employing the method of dividing the anterolateral tract of the cord for the relief of persistent pain of organic origin independent of gastric crises, and with Martin published the result of the first case illustrating this procedure. Since then the operation has been performed by Beer, Foerster, and Elsberg; and Frazier has recently published his results in six cases.

The question of segmental selection, according to Frazier, is a matter of some concern. Manifestly, the section could not be made sufficiently high, that is, several segments above the origin of the brachial plexus, with any degree of safety. He selects the 6th thoracic segment as the most convenient for all lesions not higher than the 9th or 10th segments. In his book on *Surgery of the Spinal Cord*, Frazier suggests that the 4th, 5th, or 6th thoracic segment should be selected, as this level would be appropriate not only for the relief of pain in the lower extremity but for the relief of gastric crises.

Leighton's experience in four cases suggests that the operation will produce a permanent relief in any lesion below the thoracic level. In the case of gastric crises he believes that the section will have to be made higher than the 6th thoracic segment, and sees no reason why it should not be made as high as the 2nd or 3rd thoracic. He would also add to the operation section of the posterior nerve-roots which are present in the field, as this would destroy sensory impulses which reach to a higher level and are not touched in the section of the anterolateral columns, since this section includes only pain impulses which have crosssed to the spinothalamic tract below this level. The researches of Head and Pilz would seem to show that pain and temperature fibres require four to six segments for their complete crossing in the cord. If this is so, the section of the several nerve-roots which present in the field would seem to enhance the value of the operation, especially in the tabetic case with pain involving the trunk. The removal of four laminæ instead of two, and removal of four posterior roots, would bridge the gap not included by the section of the anterolateral columns. He believes that a bilateral operation should be done in all tabetics in inoperable tumour of the cord.

## SURGICAL TREATMENT OF GASTRIC CRISES.

R. G. Shawe[2] discusses the gastric crises of tabes and their surgical treatment. A knowledge of the nervous pathways which are concerned in the production of gastric crises is essential for the efficient surgical treatment of this condition.

*Sensory Phenomena.*—From the description given by patients, the pain appears to be of a composite nature, and it is not difficult to recognize two distinct forms, one or other of which commonly predominates and somewhat obscures the other. The first form, which may be termed somatic, is felt superficially in the body wall, and consists of two types, the one sudden and shooting in character, experienced and accurately localized along the dorsal nerves; the other a dull constricting sensation which is not well localized. The first type was relieved by section of the posterior nerve-roots, which strongly suggests that it was caused by irritation of fibres which traversed these roots on their course to the spinal cord. The second type, consisting of a dull constricting sensation, does not appear to be relieved by posterior rhizotomy. The second form of pain occurring in a crisis is located in the epigastric region, commonly in the left epigastrium, and will be termed visceral. This form of pain is that most prominent at the time of the crisis ; in character it is severe and griping, and is commonly accompanied by a deep tenderness which is strictly localized to the left epigastrium.

In the majority of cases these sensory symptoms are the most profound, and hence, from the operative standpoint, it is of the utmost importance to determine the nerves implicated. There are two possible channels of conduction, (1) the vagi and (2) the sympathetic.

1. In the author's three cases, it is apparent that if the *vagi* do conduct sensory impulses they are certainly not alone in this respect, as evidenced by the superficial radiating pain along the dorsal nerves, which appears strongly to indicate an associated irritation of the sympathetic fibres passing between the stomach and the posterior spinal roots, definitely suggesting that the conduction of the visceral pain is not purely vagal. In determining the relative importance of the vagi, the results of Exner's operations for gastric crises must be recalled. In one of his patients vagotomy completely relieved the pain, indicating that painful afferent stimuli may traverse the vagi, which is further evidenced by the fact that in some cases extensive bilateral rhizotomy fails to relieve the epigastric pain.

2. On the other hand, it is clearly borne out by operative results that the *sympathetics* are the principal conductors of the irritative impulses, in that many cases of gastric crises are cured or vastly improved by posterior rhizotomy. The significance of epigastric tenderness is here of manifest importance.

He therefore concludes that both vagi and sympathetics share in the conduction of the visceral sensory impulses ; that the latter are in most cases the principal transmitters, although the former participate ; whilst in some cases the sensory symptoms are entirely due to vagal activity.

*Motor Phenomena—the Vomiting.*—Miller, after a series of experiments on cats, found that stimulation of the vagi alone produced vomiting ; in both of Exner's patients, vagotomy completely relieved this symptom. Turning to the results of posterior rhizotomy with this particular symptom in view, we find that nausea and vomiting are the invariable symptoms in those patients who relapse. Rhizotomy has severed many of the channels of irritation, but sooner or later the vagi are again irritated and the storm breaks once more.

Possibly the irritation reaches the motor centres of the vagus through the mediation of either the afferent vagal fibres or those fibres of the splanchnics which are connected with the unsevered spinal nerve-roots. In the cases under observation, signs of sensory irritation definitely preceded nausea and vomiting. They consider that vomiting is produced solely by the motor activity of the vagus, secondary to reflex irritation of the nucleus of that nerve, either through the sympathetics or its own afferent fibres.

OPERATIVE TREATMENT.—It is apparent from the preceding facts that these two main types of symptoms of the crises, the pain and vomiting, are each dependent upon the integrity of distinct nerve-channels : the pain upon the sympathetics, the vomiting upon the vagi. In order to be completely assured of a cure in all cases, both series of nerve-paths would have to be severed. Since such a proceeding would be too drastic for the condition of the patient in most cases, not to mention the physiological sequelæ, it is obvious that only one or other of the main symptoms can be attacked. In a case where vomiting and other signs of vagal irritation are present, vagotomy might be considered, bearing in mind that serious gastric stasis may result, whilst any concomitant sympathetic pain will not be alleviated.

In a case where pain is the principal symptom, section of the sympathetic fibres or their connection is indicated. The sympathetic route has been attacked in three different parts : (1) In the spinal cord by Souttar, who divided the anterolateral ascending tract between the 2nd and 3rd dorsal nerves. The immediate results were satisfactory. Complete hemi-analgesia below the level of section resulted, though one or two painless vomiting attacks occurred. (2) The posterior roots of the dorsal nerves by rhizotomy. (3) The solar plexus, which was stretched by Leriche and Doufourt in four patients, resulting in a temporary alleviation of the crises.

The operation of **Rhizotomy** in most selected cases alleviates the symptoms very considerably. In 64 cases of Foerster's, 29 were completely cured and 18 considerably improved. Radicality of resection is essential. The most satisfactory results have followed bilateral rhizotomy. Foerster performed bilateral rhizotomy of the 6th to 10th roots inclusive in one case, in another of the 6th to 11th roots inclusive ; in neither was there a return of crises. On the other hand, Thomas and Hall resected the 7th, 8th, and 10th roots ; the case relapsed in four months' time.

Finally, the possible beneficial results from the operation of rhizotomy may be reviewed. In this procedure we possess a means for combating both the motor and sensory symptoms of a crisis ; by section of the posterior nerve-roots we can abolish the superficial radiating pain, and either cure or considerably mitigate the visceral pain in most cases. Again, the reflex irritation of the vagal centres is diminished by the elimination of the irritative afferent impulses ascending the splanchnics. Consequently, in minor cases the vomiting ceases, or in severe cases is considerably alleviated. Again, by section of the anterior nerve-roots we probably possess a means of curing the diffuse type of superficial pain, and perhaps still further diminishing those impulses likely to irritate the vagal centres, though this latter deduction awaits experimental confirmation.

Shawe concludes that rhizotomy is most suitable for the majority of cases ; that it is based on sound physiological principles, and is a procedure that, when carried out to a degree proportional to the severity of the symptoms, affords a reasonable prospect of considerable alleviation, or of cure, of gastric crises.

## SPINAL CORD TUMOURS.

Elsberg[3] describes the diagnosis and surgical treatment of tumours in front of the spinal cord, and believes that tumours that grow on the anterior surface of the cord—whether extradural or intradural—give rise to symptoms which are often difficult to differentiate from intramedullary growths. For this reason surgical interference is often delayed. Furthermore, the exposure and removal of these anterior tumours is often difficult.

About 10 per cent of extramedullary spinal tumours are located anteriorly and anterolaterally to the spinal cord. As the dentate ligament forms the boundary between the anterior and posterior halves of the cord, any tumour that develops in a location anterior to the plane of the dentate ligament must be considered as lying on the anterior aspect of the cord. If, however, the growth lies in front of the dentate ligament—between it and the anterior spinal roots—its location is, more strictly speaking, on the anterolateral aspect of the cord. Frazier has collected 330 cases of spinal-cord tumours, in 35 of which (10·6 per cent) the growth lay on the anterior or anterolateral aspect of the cord. These anterior growths usually have a painless beginning. Muscle atrophies are often the first sign of the disease. When the tumour is located in the lower cervical region, the first symptom may be an atrophy of the small muscles of the hand on the one or the other side.

*The operative procedures* may be either intradural, extradural, or transdural, dependent upon the location and the size of the growth. The exact location

# *PLATE XXXVI.*

## TUMOURS OF THE SPINAL CORD

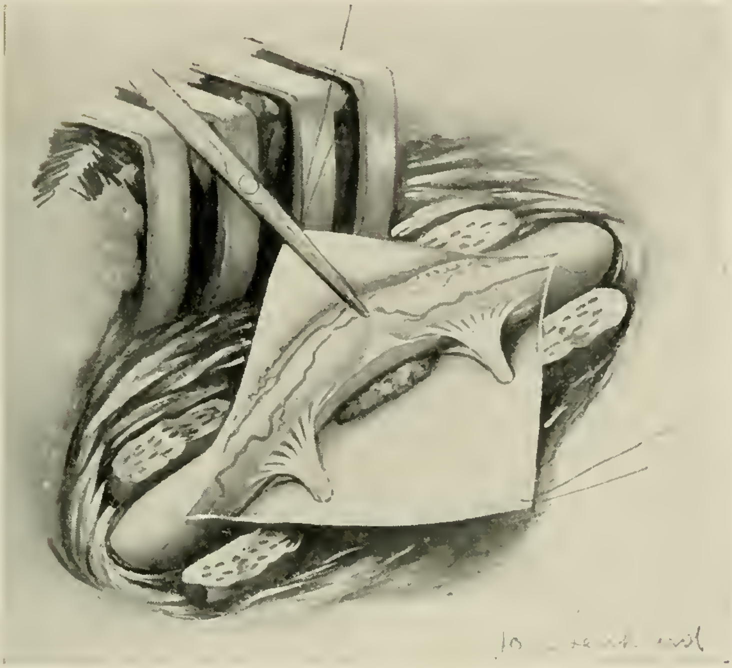


*Fig. A.*—Partial exposure of tumour in front of the cord by traction on a slip of the dentate ligament.

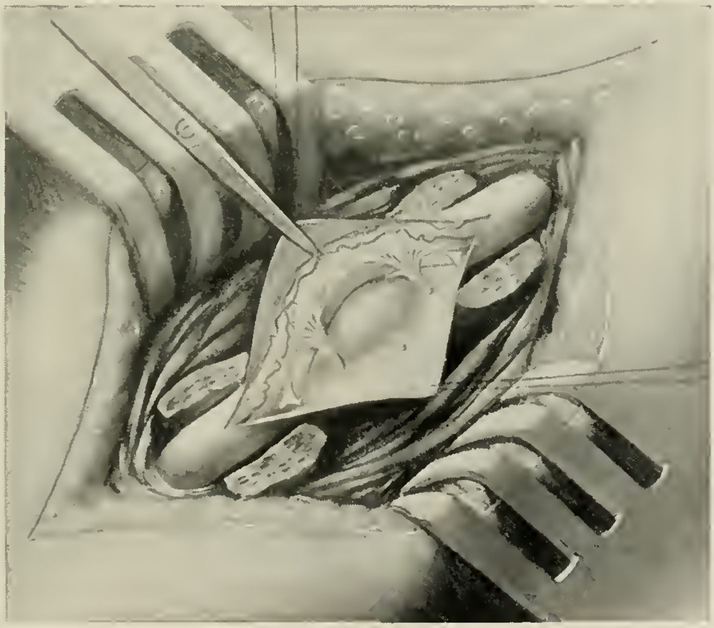


*Fig. B.*—Removal of extradural tumour by the transdural route. Exposure of tumour in front of the spinal cord.

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# PLATE XXXVII.

## TUMOURS OF THE SPINAL CORD—*continued*

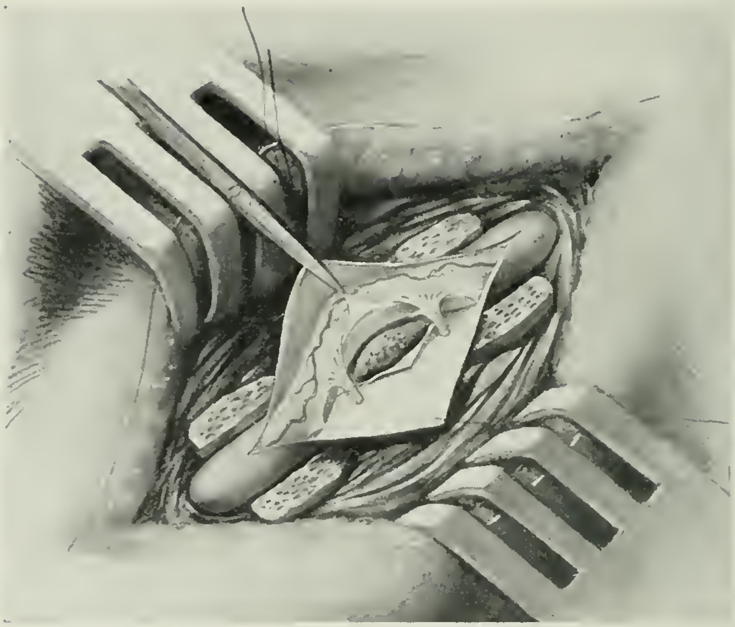

*Fig. C.*—Removal of extradural tumour by the transdural route. Incision of the anterior layer of the dura and exposure of the tumour.

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can, in many instances, be determined only after the dural sac has been opened.

In intradural growths, the method of procedure is the following: After the dura has been incised and the growth located, a slip of the dentate ligament, on the side from which the tumour is to be approached, is grasped with mosquito forceps, the slip cut free from its attachment to the inner surface of the dura, and traction made on the forceps. By this means the spinal cord is raised out of its bed, drawn to the other side, and partly rotated. If the growth is not sufficiently exposed, especially if it lies in front of the cord near the mid-line, the corresponding posterior root may have to be divided. (*Plates XXXVI, XXXVII.*)

The steps of the transdural procedure are: After the dural sac has been opened and the cord drawn to one side, the anterior layer of dura is freely incised and the growth thus exposed and removed. The edges of the incision in the anterior dura are then allowed to fall together without any sutures. He highly recommended this transdural approach as one that will endanger the cord less than the extradural procedure.

### Tumours of the Cauda Equina, Conus, and Epiconus Medullaris.

Tumours of this region are not rare. Spiller, in 1908, reviewed the literature up to that year and described eight cases. Parker[1] analyses the symptomatology, based on the observation of eight cases from the Mayo clinic. Tumours in this portion of the vertebral canal present a picture completely different from that shown by tumours higher up, and, further, tumours at widely separated levels may give almost identical signs and symptoms. The combination of sphincter disturbance, atrophic paresis of the lower limbs, and peri-anal anæsthesia is characteristic of the disease; but the determination of the position and extent of the tumour mass is in some cases an impossibility.

*Pathology.*—The strongest factor in the production of differences in course, symptomatology, and physical signs is the nature of the tumour in each case. The more malignant the type of tumour, the more rapid will be the course and the more diffuse the signs, while a slowly growing tumour will have a long course and clear-cut signs.

The sacral canal, as compared with the other portions of the vertebral canal, is relatively wide, and a tumour may grow for a long period without giving any localizing signs. A tumour in the dorsal canal, as soon as it infringes on the posterior nerve-roots or any part of the cord, will give a sharply-marked level (unless it be intramedullary); but a tumour in the sacral canal, where the first sacral root is as long as 14 cm., does not announce its position with such a degree of exactitude.

*Pain.*—The earliest and most constant symptom in this disease is pain. It is also the most distressing feature. It may appear many months, even years, before any sign of the disease is established, and, whereas at first it is light and intermittent, with long intervals of freedom, later it becomes constant day and night, and leads the patient to adopt any means to obtain relief. In a few of the patients a solitary attack of pain appeared months before it was repeated; why there should be so long an interval is difficult to explain. The patients soon discovered that movement relieved them of their agony, and, while jarring and sudden movements initiated a spasm of suffering, on the whole their pain was less severe while they were walking. Five of the eight patients had slept sitting up in a chair for months, and, when they were no longer able to walk, remained day and night in the chairs in which they were wheeled. One patient had a permanent contraction of her hamstrings from such a position. In five patients there was an intolerance to the prone position in bed. One patient spent nights kneeling on a chair and lying face downward across the table.

Pain in the lumbar spine was not confined to cases in which the vertebræ were actually eroded. It seems to have been felt even when the tumour was definitely intramedullary. Pain in the back, therefore, is not confined to cases of tumours eroding the vertebræ ; it is common in caudal tumours and even in purely intramedullary conus tumours.

To find where the pain was first felt is valuable as an idea of the starting-point of the tumour, and by comparing it with the widest limit of the pain in the later stages of the disease a good idea of the spread of the tumour may be gained. The nature of the pain is important as a point of differential diagnosis from such diseases as tabes dorsalis and multiple neuritis. Many of the patients described their pain as a steady, constant, burning ache.

*Tenderness of the Back* was present in three cases. Tenderness, while suggestive of vertebral involvement, is not conclusive. Rigidity of the lumbar spine was associated with marked tenderness in two cases.

*Muscular Weakness.*—Seven of the eight patients were weak in their lower extremities. It was not the earliest symptom, nor was it an isolated finding in any of the cases. It was associated with sensory and sphincteric disturbances in all the cases. Paresis of the lower limbs without other physical signs, and even with some pain, does not establish the diagnosis of tumour in this region.

*Sphincteric Disturbances.*—Five of the eight patients had difficulty in controlling the bladder. Next to pain it was the earliest symptom in three. It was not an isolated phenomenon, as in each case it was associated with a peri-anal or saddle hyperesthesia or anæsthesia. In three instances catheterization was necessary to empty the bladder. Rectal control seemed to have been affected in proportion. In one case there was loss of sexual power without loss of control of the bladder or rectum. In another case the ejaculatory part of the sexual act was abolished ; the power of erection was maintained.

*Sensory Changes.*—All the patients had some degree of sensory loss ; but the degree varied from a slight loss of sensation, of which the patient was ignorant, to complete anæsthesia of the lower extremities. The history of sensory change has less value than the other subjective complaints. In three cases any hyperæsthesia was denied, and a patient's statement that there is no sensory change should not be relied on. Some complained of numbness, a cold sensation, and tingling. In three cases only was there any symmetry of distribution of the anæsthesia. In one of these the anæsthesia was in the fifth segmental skin area ; in the other two over the buttocks and back of the lower extremities, with involvement of the anterior surface of the leg, but not the thigh. The degree of sensory loss of these patients was fairly in proportion to their motor weakness, but was not in proportion to the size of the tumour and the degree of involvement of surrounding structures.

*Fibrillary Twitchings*, usually indicative of anterior horn cell involvement, were present in three cases. Two of these cases were extramedullary tumours, showing that pressure on the cord will produce this sign without its infiltration.

*Tendinous Reflexes.*—As would be expected, the tendo Achillis reflex was absent or diminished in all the cases, and the patellar reflexes were intact in only one. The cutaneous reflexes were interfered with in a few cases, and helped greatly to estimate the highest level in the cord or the greatest number of roots involved by the tumour.

*Spinal Puncture.*—This procedure must always be adopted to exclude the possibility of an inflammatory or syphilitic condition of the cauda. A 'dry tap' is so rarely obtained that it is quite enough to suggest that something in the dural canal, probably a tumour, prevents the withdrawal of fluid. This was illustrated in three cases in which the canals were choked by large tumours.

If the spinal puncture is performed by experts without securing fluid, suspicion of a tumour should be aroused. In one case the xanthochromic and massive coagulation phenomena of Froin were present. This was enough to suggest a tumour above the site of the puncture, where it was found at operation. In two cases the Nonne test was positive.

Differential Diagnosis.—Every writer on this subject has deplored the frequency with which these tumours masquerade under a diagnosis of double sciatica, myositis, or neuromuscular pain, without any attempt being made to exclude the presence of a tumour. Fuchs, in 1909, coined a term, myelodysplasia, to cover all sorts of congenital anomalies of the lower portion of the central nervous system. The most prominent symptoms were enuresis, sensory disturbances, and weakness of the lower limbs. The sensory changes, weaknesses, and atrophy of the lower extremities suggest tumour ; but a careful search and *x*-ray examination disclose such anomalies as spina bifida occulta, hypertrichosis over the skin of the sacral area, lipomas of the sacrum, and associated stigmas of maldevelopment.

Hypertrophic arthritis of the lumbar spine, with root pressure from bone overgrowth, simulates tumour closely.

Tuberculous or syphilitic meningoradiculitis has to be excluded, and all possibility of syphilis in the patient sought for. Toxic neuritis of the cauda equina is difficult to distinguish from tumour. The caudal roots are swollen, discoloured, congested, and matted together.

Sacral tuberculosis may give rise to symptoms and signs like tumour, but in such cases the Röentgen ray should aid in the diagnosis.

References.—[1]*Surg. Gynecol. and Obst.* 1921, Sept., 246; [2]*Brit. Jour. Surg.* 1922, Jan., 450; [3]*Surg. Gynecol. and Obst.* 1921, Dec., 670; [4]*Amer. Jour. Med. Sci.* 1922, March, 342.

## SPINE, TUBERCULOSIS OF. (*See* Bones and Joints, Surgery of.)

## SPLEEN, SURGERY OF.

*E. Wyllys Andrews, M.D., F.A.C.S.*

**Rupture.**—That spontaneous rupture of a normal spleen can occur without trauma seems to be an undoubted fact. Metcalfe and Fletcher[1] report two such cases. Of the 12 cases of spontaneous rupture of the spleen collected by Connors,[2] the spleen was described as normal in about one-half. In several of these, however, microscopic sections were not made ; but in some the normal condition of the organ appears to be beyond dispute. Connors suggests that muscular action or sudden changes in blood-supply may afford the trauma, without which rupture seems inconceivable. It is noteworthy that the vast majority of these cases are reported in persons dwelling in malarial regions. Spontaneous rupture of the malarial spleen is more common, and in many cases not classed as spontaneous the trauma has been slight. Leighton[3] has collected 60 such cases, most of which were not diagnosed until post-mortem examination. Of 9 cases diagnosed, 2 healed spontaneously, 1 died after tamponading, 2 recovered after tamponade, and 3 recovered after splenectomy. This corresponds with the experience in other types of rupture of the spleen, that splenectomy is the operation of choice. As far as is known, none of the patients has ever suffered in any way from want of a spleen. In this connection the case reported by Eccles[4] is of interest. He had occasion to open the abdomen in a man who had undergone splenectomy for ruptured spleen eleven years before. To his great surprise an accessory spleen had undergone hypertrophy to such an extent that it could not have been told from a normal one. Eccles produced ample evidence from four persons present at the original operation that complete splenectomy actually had been done, and that the spleen weighed 13 oz.

Hauke,[5] in a discussion of this subject, says that in most of these cases the peritoneal cavity is full of blood, very large amounts being generally present, as the condition is frequently not diagnosed until extensive hæmorrhage has taken place. In all his cases he has mixed this blood with a little sodium citrate solution and injected it intravenously, with very gratifying results. The reactions have been much less than in transfusions from other persons, no matter how carefully chosen.

**Cysts.**—Further weight to the argument for removal of the spleen instead of packing it is lent by Fowler's[6] studies of cysts of this organ. Only two dermoids of the spleen are on record. In hydatids, the liver is involved primarily in four-fifths of the cases, so that the problem is not one of the spleen alone. Multiple cysts, true neoplasms, are fairly common, but are usually small and generally cause few symptoms. The remaining class is one to which he wishes to call particular attention, the pseudocysts. These are nearly always single, and tend to become very large. They make up a large percentage of those coming to operation. In the vast majority of these cysts there is definite evidence to show that they are of hæmorrhagic origin. This evidence may consist in a history of trauma, continued repeated secondary hæmorrhage into the cyst, or histological study of the cyst wall.

**Banti's Disease.**—Sweetser[7] believes that in this condition splenectomy is indicated even in the later stages. He reports a patient still living fifteen months after the operation who was only seen in what appeared to be the terminal stages. His experience has been that medical treatment has 100 per cent mortality, and for this reason an operation offering any hope of cure or palliation is justified, even though dangerous.

Lombard[8] describes an operation for removing the spleen intracapsularly. He says that in many cases of chronically enlarged spleen there has been a series of attacks of perisplenitis which result in firm adhesions to the surrounding structures. Such adhesions render removal of the spleen difficult and dangerous. They are often on the posterior or diaphragmatic surface, and must be torn through without seeing them, and the risk of hæmorrhage is great. This difficulty can be obviated by a relatively simple procedure. With the spleen in its bed the pedicle is ligated. Having thus removed the danger of hæmorrhage from the spleen itself, an incision is made in the capsule, and a plane is soon found in which one can separate the tissues with very little resistance. Thus intracapsular removal can be quickly and easily done in cases where ordinary splenectomy would be practically impossible.

REFERENCES.—[1]*Ann. of Surg.* 1922, Feb.; [2]*Ibid.* 1921, July; [3]*Ibid.*; [4]*Brit. Med. Jour.* 1921, Oct. 1; [5]*Beitr. z. klin. Chir.* cxxii, 389; [6]*Ann. of Surg.* 1921, July; [7]*Surg. Gynecol. and Obst.* 1921, Oct.; [8]*Ibid.* 289 (abstr.).

## SPLENIC ANÆMIA. (*See* ANÆMIA, SPLENIC.)

## SPRUE.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

D. Bovaird[1] finds sprue cases among the people of the United States who have never been out of the country, as well as among those returning from the tropics. He discusses the monilia theory of origin, but found this fungus in the stools of only 1 of his 13 cases, while the mouth symptoms were quite different from those of monilia infections in children; so he thinks the causative organism has not yet been found. Of 12 gastric analyses there was a total absence of free hydrochloric acid in 6, while 5 gave normal readings. The stools contained excess of neutral fat and fatty acids, the total fat varying from 25 to 48 per cent of the dried fæces, due not so much to deficiency of the fat-splitting ferment as to impaired absorption of fat; pancreatic extracts were of value in some patients, but not in others. Severe secondary anæmia is a marked feature. He recommends **Fruits** and **Proteins**, but little starchy food, and dilute **Hydrochloric Acid** or **Pancreatic Extracts** when these substances are deficient, but only expects improvement, relapses frequently occurring. Tetany is a rare but serious complication.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1921, Sept. 3, 753.

## STAPHYLOCOCCIC INFECTIONS. (*See* Furunculosis.)

## STERILITY. (*See* Testicle, Surgery of.)

## STOMACH, CANCER OF.

*E. Wyllys Andrews, M.D., F.A.C.S.*

The discussion as to the rôle played by ulcer in the production of cancer of the stomach still rages, and solution seems to be no nearer. At the Mayo Clinic ulcer has always been considered the most important agent. MacCarty, Wilson, and McDowell presented considerable evidence on this score a few years ago, especially important being the recognition of beginning malignancy in the borders of many apparently benign ulcers. Smithies, in an analysis of the material from Ochsner's clinic, is of the same opinion. Deaver and Moynihan have also supported this view. This year C. H. Mayo[1] presents another summary of this evidence, emphasizing the necessity of some chronic cell destruction to account for cancer by analogy with what we know of cancer elsewhere, and suggesting that other irritation is present when ulcer is not. Ingestion of hot foods is important.

Van Lier[2] protests against this view. He believes that malignant degeneration of ulcers does occur, but that it is rare. Especially is this true in the aged. Sixty or older speaks against, not for, cancer. For this reason all patients of this age deserve exploration, and should not be left to die of obstruction of the pylorus on the assumption that cancer must be present.

In the diagnosis of such cases, Faltin[3] suggests that inflation of the stomach is of great value. Canalization of the pylorus is well shown. The degree of infiltration of the stomach walls can be accurately foretold by their elasticity, and the operability of a case thus decided upon. The possibility not only of radical operation, but of palliation, becomes evident. That is, those cases in which even simple gastro-enterostomy can be carried out can be told without submitting the patient to exploratory laparotomy.

Taylor and Miller[4] have analysed a series of 182 cases of carcinoma of the stomach. Their conclusions are as follows:—

1. A history suggestive of pre-existing ulcer was obtained in only 17 per cent, and it seems probable that the true incidence of such a preceding lesion does not exceed these figures.

2. Reference of epigastric pain to the back occurred in 29 per cent of the pyloric cancers; and of those with reference of pain to the back, 80 per cent had involvement of the pylorus.

3. The age incidence for the beginning of 'ulcer' symptoms in the ulcer-before-cancer cases had its apex two decades later than did a series of 79 ulcer cases. This suggests either that the ulcers first giving rise to symptoms in middle life have a far greater likelihood of becoming malignant than do ulcers generally, or that the ulcer-before-cancer cases are really malignant from the beginning. Either of these considerations justifies and indicates prompt and radical surgical treatment of all patients first developing symptoms suggestive of ulcer after forty years of age.

4. The average free HCl and total acidity findings in the pyloric cancers were not abnormally low (15·5 and 45), but there was evidence of definite

retention. There was also retention in some of those of the lesser curvature involvement. When the cancer was situated elsewhere, retention did not occur, but the acid figures were distinctly low.

5. Röntgen study gave a positive diagnosis in 96·8 per cent, and was misleading in but one case.

6. At operation the tumours were shown to be somewhat more extensive and to involve more often the lesser curvature than the Röntgen ray suggested.

7. Of the patients with gastric cancer who now come to the surgeon, about one-third are given a chance of cure by radical operation, about one-third are treated palliatively, and for one-third nothing can be done.

References.—[1]*Jour. Amer. Med. Assoc.* 1921, July 16; [2]*Ibid.* Dec. 17, 2011 (abstr.); [3]*Ibid.* Oct 22, 1380 (abstr.); [4]*Amer. Jour. Med. Sci.* 1921, Dec.

## STOMACH, ULCER OF. (*See* Gastric and Duodenal Ulcer.)

## STREPTOCOCCUS INFECTIONS. *J. D. Rolleston, M.D.*

L. Howard Smith[1] reports an epidemic of nine cases of *Streptococcus hæmolyticus* septicæmia which occurred in a nursery home among bottle-fed infants whose ages ranged from one month to seven and a half months. The epidemic was remarkable for its sudden onset in previously healthy children instead of in convalescents from measles or influenza (*see* Medical Annual, 1920, p. 331); the entire absence of vomiting and diarrhœa, which are usually present in all acute infective processes in infants; the absence of any apparent localized infection except in two cases where there was marked pharyngitis and cervical adenitis; the absence of any pulmonary involvement except in two cases very late in the disease; the generally good appearance of the patients until very near the end; the uniformity of positive blood and throat cultures; and the constancy of peritonitis, which was present in eight of the nine cases. The source of infection was probably two streptococcus carriers in the nursing staff. The milk could not be incriminated, as not only did cultures of the milk show an absence of *Str. hæmolyticus,* but it was also the custom to boil all the milk and water used for feeding for at least three minutes.

Reference.—[1]*Amer. Jour. Dis. Child.* 1922, ii, 171.

## STRICTURE OF RECTUM. (*See* Rectum.)

## SURGERY OF BONES AND JOINTS. (*See* Bones and Joints, Surgery of.)

## SURGICAL TREATMENT: GENERAL. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Team Work.**—If I were asked to say, in one or two sentences, what is essential for successful surgical work, I would first quote a saying which was posted up on the walls of a Dublin school for boys: "Trifles make Perfection, and let me Tell you that Perfection is no Trifle". Next in importance comes simplicity. "In the craft of surgery", says Moynihan, "the master word is simplicity". But, above all, team or group work is essential in order to carry out modern methods. It is just as easy for a single general in the field, without the aid of a staff of experts, to control aircraft, tanks, artillery, transport, and all the paraphernalia of modern warfare, as for a surgeon (or physician for that matter) to undertake single-handed the many complexities of even a simple case. There was a time when individuals counted in the profession of medicine, as in the profession of arms; but that day is over. The field-marshal and the surgeon must have a thoroughly trained staff, the co-ordinated brains of which are used in the solution of every problem. Of course the brains must be good. It is said that the Duke of Wellington, when inefficient staff officers were sent to his side, remarked: "I do not know what effect these gentlemen will have upon the enemy, but, by God, they frighten me!"

What is meant by team work? This question may be answered by saying what is not meant. Consultations, as we know them, have no connection with the modern conception of team work as applied to a surgical case. Sending portions of pickled meat to a laboratory at a distance, and placing reliance on the report received—the surgeon never seeing the pathologist, and the pathologist never seeing the patient—is an insult to modern thought. It is a dangerous practice, unfair to the patient, to the pathologist, and to the clinician in charge. Such methods are unreal, and should have no place in co-ordinated clinical effort; but clinicians are to blame if they are content with counterfeit coin. Medical pathology, leading up to vaccine therapy, is better understood in these countries than the modern conception of gynæcological pathology and surgical pathology as it exists in the living. Many examples could be cited of how the detachment of the pathologist from the clinician, and the clinician from the pathologist, has led either to disaster, or nearly to disaster, in the management of a surgical case.

If we study the careers of great surgeons, it is "difficult to understand at first why, for example, the late Professor Kocher, of Berne, stood head and shoulders above his neighbours and colleagues, men apparently with equal opportunities and a corresponding amount of grey matter".[1] Kocher was a superman, but also a type of surgeon well represented in England, Scotland, France, and elsewhere. Unfortunately, there were others.

In one clinic an immense amount of operative work would be completed daily. One case after the other would reach the operating room as if those responsible for the preparation and anæsthesia could see through closed doors and always be ready at the psychological moment. Seldom at the operation was it found that an incorrect diagnosis had been made. The physician, radiologist, biochemist, and all concerned were generally present to watch their observations put to the test. One could see the wheels working in a well-oiled machine.

A visit would be paid the next day to some other clinic. A few words with the surgeon, perhaps, would leave the impression that the coming performance was to be headed by a genius. But in this case the anæsthetic was not taken well: after the first abdominal incision the recti fought against further interference, and there was a delay; or, after opening the abdomen, the intestines made efforts to escape, as a result of incomplete anæsthesia or improper pre-operative preparation. The *x*-ray photographs did not correspond with what was actually found; some vital point in the blood or urinary examination had been omitted; and those from whom information was required were not forthcoming. When, finally, the next case was expected in the theatre there were confusion and hurried orders, and the third patient appeared instead of the second. It is just the difference between the work of a well-trained team and the inco-ordinated action of isolated and often incapable individuals.

It is unreasonable for those living in small cities to expect, within any measurable time, to reach such a state of perfection as is to be found in Rochester, U.S.A.; but let us remember that the population of that city is only about 8,000, and the vast medical organization was built up by the efforts of two men. This feat was accomplished by constant travel and the exercise of a well-balanced judgement on the part of those two Mayo brothers, who were determined that the best from the surgical world should be imported into their own domicile.

Those who have had an opportunity of visiting Rochester have seen that post-mortem examinations are made regularly, and every doctor concerned in the case must be present. The patient may have died after gastrectomy for cancer of the stomach. There is evidence, perhaps, that the $x$-ray picture was misleading. The radiologist is present, and explains the fallacies of his critics. How was it in this case—cancer following chronic ulcer—that no hydrochloric acid was found at one examination, and on the same day hyperchlorhydria was reported on the chart? Those responsible come forward and give details of numbers of cases where secretion of hydrochloric acid is inhibited at the time of testing, perhaps from the sight of the tube, perhaps in relation to the time of the last meal; hence the frequent necessity of fractional gastric analyses and tests at quarter-hour intervals when the results of such an examination are considered of importance. So the discussion at the post-mortem goes on, until finally the cause of death is attributed to, say, infection at the line of anastomosis; and the onus is then placed on the surgeon to explain why, in this case, he adopted an operative technique which had failed.

So much for the idea, in outline, underlying team work. It can be carried on without extra staff and without extra cost—to a sufficient extent, at all events, to change antiquated and defective into modern and safer methods.

Salvation lies in travel, and those who are coming on to take our places should be encouraged to see the world before undertaking appointments on the staff of a hospital. Travel gives a rude awakening to those who suffer from the soporific effect of self-contentment and self-esteem.

**Pre- and Post-operative Treatment.**—As experience grows, one is impressed with the fact that, to reach satisfying results, equal care must be taken of the patient before, during, and after operation. While our minds are taken up with operative technique and diagnosis, other important issues must not be forgotten.

Carey[2] and others, following on the work of Crile, advise the alkalinization of operation cases. After referring to Crile's theory of acid intoxication, and discussing the connection between acidosis and shock, he insists that the body fluids must be preserved, and the alkali reserve must be maintained. He concludes emphatically that the giving of alkalis before operation lessens post-operative discomfort, that catheterization is required less frequently, and that 'gas pains' are reduced to a minimum.

The sisters in Mercer's Hospital, Dublin, in charge of the wards have the following written instructions in connection with the patients under my care:—

*Preparation Before Operation*:—

1. Twenty grains of bicarbonate of soda every four hours, for two or three days if necessary, until urine is alkaline.
2. Large quantities of water by the mouth, or saline by the rectum, for the ten or twelve hours preceding operation.
3. In anxious cases, or in children about to undergo bone operations, glucose to be given if possible for two or three days before operation.
4. No enema on morning of operation.
5. No laxatives to cause purging in patients preparing for operations. Simple laxatives, as in non-operative cases, are alone necessary a day or two before.
6. Special instructions to be given in cases of intestinal cancer.

*Patients After Operation*:—

1. Unless restricted for some special reason, such as fracture of bones, etc., the patient may move as much as he likes in bed from the first after operation.
2. The patient may sit up out of bed on the second or third day after ordinary operations, provided they are not drainage cases and there is no fever.
3. The freedom of the room to be given after four days, a bath after seven days, and out for walks or drives not later than the tenth day.

Rowlands[3] holds that many of the dangers of operations are due to unnecessary restrictions. He says, very truly, that complete rest in bed depresses the spirits and lowers the physiological actions and general vigour of the body; the heart beats less frequently and less forcibly, breathing becomes slower and shallower, the appetite fails, the digestion flags, the bowels become more sluggish. Under these conditions thrombosis and pulmonary embolism are more likely to occur. It is easier to avoid the formation of a clot than to prevent it shifting. As regards the healing of wounds, complete rest is unnecessary, and even harmful, by interfering generally with the local circulation and nutrition. Hernia does not follow early and gentle exercise. Children and infants are difficult to keep still, and yet heal and recover better than adults.

I was operating in Mercer's Hospital a few days ago when a doctor strolled into the theatre. His gall-bladder had been removed ten days before; he was up and about five days after operation.

It is not suggested, says Rowlands, that patients should be rushed back to work, or that one patient should be treated, of necessity, in the same way as another. Obviously, after removal of the thyroid gland in a case of Graves' disease, the whole plan of management is different from that in a case of simple appendicitis.

All surgeons are agreed that prolonged convalescence and dieting for two or three months are necessary after gastrojejunostomy for active ulcer: but only the first few days of this period need be spent in bed.

In Zurich,[1] the routine treatment of surgical cases is along these lines. It is recognized there that the mere fact of lying in bed for any considerable number of days produces, in itself, an illness. The day following operation the patient is up, and again it is emphasized that no cases of ventral hernia follow clean abdominal cases subjected to this treatment. It is fallacious to think that early movement after operation causes non-union of the wound; experience shows the reverse to be the case. It is possible that something analogous to Wolff's law operates in the case of the soft tissues.

Again, from Zurich comes the belief that preliminary purging is scientifically unsound, and if this is combined with enemata on the morning of operation, the patient starts at a distinct disadvantage. Sir Berkeley Moynihan[5] supports this view. "Solid food", he says, "is much like liquid food by the time it gets well on its way in the jejunum. As much fluid as the patient wishes to have should be allowed to within an hour or two of the time arranged for any operation, and as soon as possible afterwards. Operations on the stomach are no exception. An enema generally clears the colon quite as much as is necessary. Aperients increase the number and the virulence of the intestinal micro-organisms, and are apt to deprive the patient of a large amount of fluid and to cause exhaustion: effects which are all most undesirable."

Brisk purgation before, and sips of water after, is a sure way of adding to the discomfort and, to some extent, to the dangers, of operation.

**Temperature of the Operating Theatre: Pulmonary Complications.**—Should the theatre be hot? I follow Rowlands'[6] advice, and arrange for a temperature of about 65°, with good ventilation, and the avoidance of excessive moisture. Shock is probably more severe after operation in unduly hot and stuffy operating theatres. The patient perspires, and gradual evaporation from the surface of the body results in perhaps considerable loss of fluid. But, apart from these considerations, and the dangers of pulmonary complications arising from rapid change of temperature, the effect of excessive heat on the surgeon and his assistants is worth mentioning.

It is pointed out that Leonard Hill and others, who investigated the causes of industrial fatigue, proved that the capacity for work rapidly diminished in a temperature rising above 65°, and that a vitiated atmosphere laden with moisture added to the bad effect of heat. "A surgeon and his assistants working under such conditions cannot give their best work, however anxious they may be to do so." Surgeons of the past decade were powerful advocates of the hot theatre, and they seemed to enjoy puffing and blowing in a lather of perspiration. Are we slaves to this example, as in so many other matters? Is the very hot operating theatre merely a hallowed tradition which is very difficult to destroy, or is it beneficial and useful?

*Pulmonary Complications.*—Apropos of the temperature of the operating theatre, pulmonary complications in connection with operations should be mentioned. To send the patient from a hot theatre along a cold passage into a moderately heated ward is asking for trouble. The least one can do, under such circumstances, is to see to it that the patient's head is covered over with a blanket, in order to prevent the inhalation of cold unfiltered air.

The relationship between abdominal operations and subsequent chest complications is regarded of late in a more clear light. It is recognized that the diaphragm is the piston of respiration, and that anything which interferes with its descent may cause œdema and congestion of the lungs. The late J. B. Murphy wrote some illuminating articles on this subject; and recently Wilkie[7] has called attention to the frequency with which crepitation is found at the base of the right lung in cases of acute gall-bladder trouble. In my experience, this pulmonary sign is not confined to acute conditions in the gall-bladder, but may follow any acute condition in the right upper abdomen, including post-operation conditions.[8] This is probably due to the fact that the diaphragm will not descend. The pulmonary condition, if post-operative, clears soon after the first thorough evacuation of the bowels.

It is very difficult to distinguish between an acute upper abdomen associated with crepitations at the base of the lung, and commencing pneumonia with referred pain. We are apt to jump to the conclusion that pneumonia is commencing when crepitations are distinctly heard. [In a recent case a bullet was extracted from the region behind the right kidney. The wound healed per primam, but on the fifth day the temperature rose, there was a slight cough, and crepitations were distinctly heard at the base of the left lung. A probe was passed between two stitches, and a large hæmatoma was discovered and evacuated. The pulmonary crepitations disappeared the following day.—W. I. de C. W.]

Four times in the last eighteen years I have experienced the tragedy of pulmonary embolism in my practice. Three of the four were private cases. The operations were all of a simple kind, and, in the generally accepted sense, there was no infection. Most surgeons have experience of this calamity at one time or another. It cannot be foreseen, nor, to any certain extent, prevented. Does morphia before operation, the Trendelenburg position during operation, or the Fowler position after, create a tendency to thrombosis in those past the prime of life? Children are immune, and it seldom follows operation above the diaphragm.

Attention has been drawn recently to all these points. Gordon Watson[9] says: "If we do not reduce a patient to pulp before operation, or allow him to bleed at operation, or fail to be generous with fluid after, we shall at any rate not impoverish his blood-supply. If we avoid strained positions at operation and fixed positions after, if we stimulate respiratory and muscular effort during convalescence, we shall do no harm, and perhaps avoid disaster".

**Care in Avoiding Sepsis and Unnecessary Trauma.**—We could go to the operating theatre with a light heart if we were certain that not only a perfectly smooth running technique was in waiting, but also if we had deeply ingrained in our mind the belief that the ultimate effect of the procedure would be followed by cure. How often do we have some misgivings as to the amount of permanent relief our perfect operations will provide? This is the acid test of a successful operation. It is melancholy to hear it said of anyone that he is well content with his results, that the wounds never become infected, that the theatre sister—however unsuited for her post—is an angel from heaven, and that a change of technique for the better is impossible. There has always been the inevitable make-believe that the hands of the surgical clock can remain stationary. Men are content to live with their heads in the sand, and by a process of Coué-ism satisfy themselves that their own methods represent the finality of perfection.

It is a strange thing; but many still think that infection does not occur if suppuration is not apparent. Sir Berkeley Moynihan's writings are inspiring on this subject. In speaking of results he says: "A surgeon may be a prejudiced witness as to his own efforts, and a bad judge of his own merit. When we speak, for example, of 'healing by first intention', what do we mean? What is our standard? Let us take extreme examples. In the one we mean a wound which heals within a few days, leaving a thin, straight, narrow line of palest pink. Across this line and the stitch marks everything appears 'cold'. There is no redness, no swelling, no stiffness or induration, and at the line itself the most accurate apposition of skin edges is seen. There is no discharge from the wound. There has been neither local nor constitutional reaction following the operation. In the other, we mean a wound which is anything but straight: the edges are jagged, they do not meet accurately at every part, they overlap here and there: the line of healing is broad and irregular, raised and red: a sticky discharge oozes from the unapposed surfaces, and a scab may lie where this discharge has dried. The parts around are raised, tender, doughy, or stiff. The stitches seem to sink into the skin. You may see wounds of this kind in some clinics, and hear a complacent comment that the wound has healed by 'first intention'. Such wounds are the clearest evidence either of a bad technique or of a clumsy operator, or perhaps of both.

"Surgery should be a merciful art. The cleaner and the gentler the act of operation, the less the patient suffers, the smoother and the quicker his convalescence, the more exquisite his healed wound, and the happier his memory of the whole incident—to him probably one of the most important in his whole life".

It is a delight to quote Moynihan, who is a master mind on the subject of technique. He has shown that although a visitor is nowadays gowned, masked, and his head covered with a cap in all hospitals, yet the organisms from dirty boots and soiled trouser legs, if the wearer moves about freely in the theatre, are scattered broadcast, as the simplest experiments have proved. Large canvas overalls for the boots and the lower part of the legs will afford ample and secure covering to these possible sources of infection. He ridicules, as did Kocher before him, the common practice of washing hands in a basin of still water. The moment the hands are soaped and rinsed, the water is polluted by the dirt washed off the skin. If the washing is continuous, it is obvious that the hands are being constantly infected by the contaminated water, and it is really not uncommon, he says, to see a piece of soap used to lather the hands being laid down and picked up again. Washing under running sterile water is the simple, effective method.

In the early part of 1914 I was in Liverpool when the *Lusitania* arrived with the late Dr. J. B. Murphy on board. He was on his way to visit the English surgical centres. We travelled together for four or five days. What an education it was to listen to this giant in surgery, whose fame had spread into every land. After watching some of the larger bone operations at this time performed by Sir Robert Jones, I wondered why we general surgeons had not long before thought of clamping off the skin edges with sterile towels, as was practised in this famous Liverpool Orthopædic Clinic. Here were we surgeons covering up every part of the patient with sterile sheets, except the skin round the wound with which our instruments and hands were in constant contact. There was the underlying idea, no doubt, that treatment of the exposed skin with germicides rendered it sterile for perhaps an hour on end. Those of us who used tincture of iodine for preparation were in greater danger of failure than others who used more effective agents, such as picric acid or brilliant green. Since my lesson from Murphy and Jones in 1914, towels have been fixed to the wound edges and no portion of skin exposed during operation. If the bacterial effects of iodine on the skin are tested—and to do this it is necessary to remove it by a solution of potassium iodide and wash with sterile water in the first instance—infection, according to Moynihan, can be demonstrated in over 50 per cent of the cases. Tincture of iodine after washing of the skin with alcohol is my own preparation, but on recent bacteriological reports I intend to give it up. Culture tests of iodized catgut, just as culture tests of iodized skin, may be negative even in the presence of contamination unless certain precautions are taken; but on this subject others are more fitted to speak. I believe there is no such thing as 'timed' catgut; the rate of absorption depends, *inter alia*, on the amount of tension under which it is introduced.

Scratches across the skin made with a fine needle at right angles to the intended line of incision show us the points at which to introduce the sutures with mathematical accuracy. Without this mathematical accuracy there is never perfect beauty in the wound. For my own part, I use the finest and lightest instruments obtainable, and when vessels are clipped I try to avoid including the mass of tissues surrounding them. A strangled tissue needs digestion by leucocytes in the wound, with some reaction and discomfort to the patient.

An instrument sterilizer should boil within easy reach of the operation, so that instruments such as the knife, clamp, scissors, and inverter, used in removing an appendix, may be re-sterilized before again touching the sheets within the operation area. It is difficult to get perfect healing in our general hospitals as organized to-day. I do not mean healing 'by first intention'; that is easily obtained, but may be very imperfect. I mean the healing of a wound without any local or general reaction whatever, followed by a convalescence with little or no pain or discomfort.

We all have seen cases after major operations such as resection of the colon, gastrectomy, and so forth, sitting up in bed discussing current topics and reading the newspaper on the morning following operation.

Crile speaks of 'carnivorous surgery;' Moynihan refers to those who operate upon the principle of 'canine attack'; we all know the breed which advocates work with one eye upon the clock.

In Blackrock (Ministry of Pensions) Orthopædic Hospital, where we had our septic cases isolated as if suffering from the plague, where the best theatre sister and nurses were selected because of a splendid record of efficiency and training, and were never changed; and where, by common consent, a miniature team became established, we were able to obtain results which I, for one, cannot secure in the 'rough-and-tumble' of a small teaching hospital. Really good results in the strictest sense can be obtained in private practice if the surgeon insists upon the patient having the best obtainable from his (the surgeon's) point of view; all other considerations must be turned down.

It requires a surgical gymnast to operate one day in one place and the next day in another, with the consequent change of the attendant personnel. No one, save a juggler, can do justice to surgery under such altering conditions.

**Combined Local and General Anæsthesia.**—Space does not permit me to dwell on the wonderful effect of combining local anæsthesia with general anæsthesia as a routine in surgery. Apart altogether from Crile's[10] fascinating theories about the prevention of shock, which I saw him put into practice two years ago, the fascial divisions and minute anatomical structures are rendered plain and distinct, perfect relaxation of muscles is assured, and, if the method is thoroughly carried out, the after-effects of nerve blocking are admirable. For twenty years, following a lesson from Kocher, I have used the method almost as a routine. (*See also* ANÆSTHESIA.)

My last word is to urge the necessity for us all in the common cause to throw a searchlight on the defects in our work and in the institutions in which we work. By constantly drawing attention to conditions which are a handicap, and thwart our intentions and ambitions, a remedy may be found. There is splendid surgical and medical work at present carried out in these countries, but let the splendour lie in subdued light for a moment: it is the dark and dusty corners which require illumination. The plan of emphasizing defects in our surroundings does not lead to popularity, but we can say of unpopularity what has been said of jealousy: "It is the tribute paid to youth for successful enterprise in thought or in action by minds which suffer from the atheroma of advancing years." Osler recommends us to live in and with the third decade in company with the younger, more receptive, and progressive minds.

REFERENCES.—[1]*Dublin Jour. Med. Sci.* 1921, Jan.; [2]*Surg. Gynecol. and Obst.* 1921, Oct., 381; [3]*Brit. Med. Jour.* 1922, Jan. 14; [4]*Lancet*, 1922, March 4; [5]*Essays on Surgical Subjects* (Saunders); [6]*Lancet*, 1922, Aug. 5; [7]*Brit. Med. Jour.* 1922, June 10; [8]*Ibid.* June 17; [9]*Practitioner*, 1922, June; [10]*Trans. Roy. Acad. of Med.* 1914, xxxii, 132.

## SYPHILIS. (*See also* EYE AFFECTIONS.)

*Col. L. W. Harrison, D.S.O.*

*Immunity in Syphilis.*—F. Eberson[1] has studied the protective power of the serum of syphilitic patients and of syphilitic rabbits against infection of rabbits with virulent *Sp. pallidum.* Controls showed that previous admixture with normal serum, either rabbit or human, always failed to prevent infection from inoculation with the strains of *Sp. pallidum* employed. These were three in number: (1) From a penile chancre; (2) From a gland of a patient with latent syphilis; and (3) From the semen of a patient with latent syphilis; they were kept virulent by regular passage through rabbits. The sera from six persons suffering from latent syphilis, infection dating from three to twenty-five years, when mixed in an amount of 2·0 c.c. with 0·1 c.c. emulsion of *Sp. pallidum*, prevented infection by the latter. Sera from the following sources also protected: a woman who had been under antisyphilitic treatment up to fourteen months previously and gave a negative Wassermann reaction; a woman with no history of infection but with a blood reaction positive to non-cholesterinized antigen only; her child, age 18 months, apparently healthy but with a similar blood reaction; similarly the sera of seven women and two men with no history of infection but with positive Wassermann.

On the other hand, the sera of seven patients with fairly recent infections, dating about two years, failed to protect, though the reaction was positive.

Treatment did not appear to lessen the protective value of a serum. The experiments appear to show that time is an important factor in the accumulation of immune substances in the blood, and that relatively the process is a very slow one. Animals inoculated with a mixture of protective serum and virus subsequently showed no signs of dissemination of *Sp. pallidum* as tested by subinoculations with their heart-blood. Inoculated rabbits developed effective immune substances in from six months to a year. The author suggests that the serum of definitely established latent cases, i.e., possessing protective properties, might prove of therapeutic value, though the large amount of immune serum administered in relation to the virus should be noted.

R. Brandt[2] relates some cases which appear to show that some people have a natural resistance to syphilitic infection. In 1169 prostitutes examined regularly over a varying number of years, 21 were found free from syphilis after four to five years; 21 after six to ten years; and 14 after ten years or more. Four prostitutes of the lowest class were found uninfected after innumerable exposures in eight to sixteen years. That these cases cannot be explained on the ground of their being latent syphilis is shown not only by the absence of all signs, clinical, serological, and in spinal fluid, but also by the fact that some became infected at a later date. The author suggests that possibly they were protected by the toughness of the surfaces exposed.

*Transmission of Syphilis.*—R. Lakaye[3] has demonstrated *Sp. pallidum* in the semen of secondary syphilitics microscopically 5 times out of 22, and 9 times by inoculation into rabbits (Bertarelli method). The author recalls that Uhlenhuth and Mulzer obtained 3 positive results by inoculation of semen into rabbits' testicles, and Pinard and Hoch, in 1920, found sp. pallidum microscopically in 3 out of 11 specimens of spinal fluid. He discusses the question of conceptional syphilis, and, though pronouncing it open, relates some cases which support the conceptional theory. In one of these, a husband was infected in Germany, in 1917, and received sixteen intravenous injections. He returned to Belgium in 1918. In the same year his wife gave birth to a dead infant at six months. In 1919, and again in 1920, a seven-months child was born dead. The mother showed no signs of syphilis, and her Wassermann reaction was negative. In 1921 she again became pregnant and, though she still showed no clinical or serological sign of syphilis, she was put on treatment from the third month, with the result that a child was born who remained to all appearances well for eight months. Lakaye asks if the mother was syphilitic. [It appears to the reviewer that such a case as this does not prove conceptional syphilis, since a person may give a negative Wassermann though showing obvious signs of syphilis, while in many women with positive blood it is not possible to discover clinical evidence of syphilis apart from the history of pregnancies.—L. W. H.]

S. Feldman[4] reports a case in which a woman infected in 1914 received very little treatment, married again in 1916, and gave birth to two apparently healthy children, besides having no miscarriages or showing other signs. In 1921, however, her second husband developed a chancre, which Feldman considers, after carefully sifting the evidence, he contracted from his wife. The author quotes some discoveries of other workers which bear on this question. Thus Freuwald found *Sp. pallidum* in the lymph glands of 10 per cent of latent cases. Engman and Eberson found them in the glands of 3 out of 14 cases, and in the seminal fluid of 2 out of 17 cases, while Arzt and Kerl found them in the chancre scar of a man who had been clinically and serologically negative for eight years. Kleeberg[5] relates a case in which a woman passed through fifteen pregnancies, nearly all the results showing signs of inherited syphilis, including the fifteenth. He advocates treatment of practically every pregnant woman with a history of syphilis.

*Syphilis and Fœtal Death.*—Eardley Holland has made a detailed study of 300 dead fœtuses of viable age to determine the cause of death. The result has been published in a Ministry of Health Report;[6] to which reference must be made for details. The report shows that 16 per cent are attributable to syphilis. There were 37 fœtuses in which spirochætes were found ; 5 in which other evidence ascribed the death certainly to syphilis ; 6 in which syphilis was the probable cause ; and 14 in which it was possible. The result of this investigation, which shows that the impression of the Royal Commission on Venereal Diseases greatly exaggerated the importance of syphilis as a cause of fœtal death, agrees fairly closely with the figures of Whitridge Williams for whites (MEDICAL ANNUAL, 1922, p. 435).

J. N. Cruikshank[7] has investigated the records of 1000 obstetrical cases, and examined 3500 specimens of maternal, placental, and infantile blood. He found a positive reaction in 9 per cent of 1900 unselected mothers, showing again an incidence of about 10 per cent of syphilis. In 1000 pregnancies there were 12·8 per cent of abortions (i.e. termination of pregnancy before the seventh month). In the Wassermann-positive series there were 6·17 per cent of abortions, and in the Wassermann-negative 13·17 per cent, so that syphilis does not appear to be a prominent cause of abortion. Still-births occurred in 18·07 per cent of the positive series and 15·15 per cent of the negative. Premature birth of viable infants occurred in 32·54 per cent of the positive series and 19·88 per cent of the negative, showing the importance of syphilis as a cause of premature birth. Of the 133 premature births in the negative series, 34·61 per cent were still-born ; and of the 27 in the positive series, 68·75 were still-born, so that premature birth due to syphilis appears to be much more fatal than when due to other causes. [It is a matter for congratulation that, thanks to the studies of the above and other workers, it is becoming possible to estimate with fair accuracy the toll levied by syphilis in infantile mortality. Broadly it seems possible to say that efficient ante-natal antisyphilitic treatment would save at least 16 per cent of the loss due to fœtal death, and to this must be added the percentage of syphilitic deaths in infancy.—L. W. H.]

## DIAGNOSIS.

*Intracutaneous Tests.*—*Gelatin.*—A. Busacca[8] has found that the intracutaneous injection of 0·1 c.c. of 10 per cent gelatin produces a reaction in a high percentage of syphilis cases. The gelatin must be solid at room temperature ; if fluid it never acts. In positive cases the first grade of reaction is shown in six to twenty hours by a reddening at the site of inoculation, with perhaps some slight infiltration. A more intense reaction is accompanied by swelling of the part and some reddening over the lymphatics. The reaction usually dies down in about forty-eight hours, but occasionally returns in about three days. Out of 292 cases of syphilis, the gelatin reaction was positive in 208 and the Wassermann reaction in 240. The analysed results showed :—

| | Cases | Positive gelatin | Positive W.R. |
|---|---|---|---|
| Primary syphilis .. | 29 | 27 | 20 |
| Secondary ,, .. | 149 | 95 | 140 |
| Latent ,, .. | 90 | 69 | 59 |
| Congenital ,, .. | 8 | 4 | 8 |
| Parasyphilis .. .. | 16 | 12 | 13 |

Cases of tuberculosis also react to gelatin, but in a smaller percentage, the author having obtained positive results in 13 out of 30 cases of tuberculosis of the skin. Horse serum injected intracutaneously produces stronger and more frequent reactions in tuberculosis than syphilis, so that, if the reaction is positive to both serum and gelatin, the evidence is in favour of tuberculosis rather than syphilis.

*Luetin.*—Alderson,[9] after reviewing the literature (44 articles), which agrees generally that, in the absence of iodide, thyroid, bromide, or nitrate administration, luetin is a valuable test for syphilis, especially in the latent and tertiary stages, relates an experience with the products of the three firms now making this reagent in U.S.A. He concludes that they must have deteriorated, since the results were not at all like those he experienced with luetin he obtained at an earlier date from Noguchi.

*Effect of Drugs on the Luetin Test.*—It is known (Sherrick and others) that the ingestion of bromides and iodides may cause non-syphilitic subjects to act positively to the luetin tests. A. Strickler[10], having found that if the luetin test was repeated on a non-syphilitic subject it gave a positive reaction in 21 per cent of cases, proceeded to test the effect of arsenical injections, and found that 53 per cent of 17 non-syphilitic subjects gave a positive reaction after injections of arsenobenzol. The effect of cacodylate of soda was less, only one out of five patients reacting. Syphilis was excluded in these cases prior to the above tests by history, two negative Wassermann reactions, and a negative luetin test.

*Early Diagnosis by the Wassermann Test of Chancre Fluid.*—It is agreed that the quickest method of diagnosing syphilis in the early stages is by the dark-ground microscopical examination of the chancre fluid for *Sp. pallidum.* Cases of syphilis occur, however, in which *Sp. pallidum* cannot be found in chancre or glands. J. Klauder and J. A. Kolmer[11] have shown that the chancre fluid may give a positive reaction before this occurs with blood serum obtained in the ordinary manner. The investigation both indicates a practical method of early diagnosis, and suggests the close relation between the tissue changes in syphilitic infiltrates and the production of Wassermann substance.

*The Reliability of the Cold-fixation Modification* of the Wassermann test and its delicacy have been investigated closely by Keidel and Moore[12] in the case of 30 normal individuals, 77 sick persons presumably non-syphilitic, 148 treated syphilitics, and 48 untreated syphilitis, whose sera were tested with—

| | | |
|---|---|---|
| (*a*) Plain antigen<br>(*b*) Cholesterinized antigen | Using the water bath at 37° C. | for preliminary fixation. |
| (*c*) Plain antigen<br>(*d*) Cholesterinized antigen | Using the ice chest | |

The technique was that described by Kolmer and Rule.[13] No non-specific reactions were discovered. The ice-chest method gave 10·7 per cent more positives in untreated cases, and 37·8 per cent more in treated cases, than when preliminary fixation was at 37° C. The authors consider the ice-chest method an advance on the water-bath for the regulation of treatment, but are not quite prepared to accept it unreservedly for primary diagnosis.

*Flocculation Tests of Syphilitic Serum.*—The interest in the flocculation method of detecting syphilitic serum which has existed almost from the introduction of the Wassermann test has been strengthened enormously since the introduction of the Sachs-Georgi test (MEDICAL ANNUAL, 1921, p. 446). Various workers have aimed to improve the Sachs-Georgi test, mainly by refinements in the method of making and diluting the extract, and Dreyer and Ward, as also Vernes, have gone further in the direction of evaluating with precision the strength of the flocculation reaction (MEDICAL ANNUAL, 1922, p. 421).

R. L. Kahn[14] has recently introduced another modification, which differs from others in the extract, which contains acetone-soluble fractions, and in the method of dilution with saline. The results appear to be very closely parallel with those of the Wassermann test. [The reviewer is indebted to Dr. A. L. Urquhart for permission to review in advance a paper to be published shortly in the *Lancet* which records a comparison of the Wassermann and flocculation tests on 1000 sera. The feature of this work is its demonstration of the fact that the amount of cholesterin to be added to the extract varies with the extract, and must be determined by trial before the mixture is taken into use. Thus, out of six heart extracts prepared by a modification of Bordet and Ruelens' method, the proportions of 1 per cent cholesterol required to be added to obtain optimum results were: in two, 0·3 c.c. to 0·7 c.c. heart extract; in two, 0·2 c.c. to 0·8 c.c. heart extract; in one, 0·1 c.c. to 0·9 c.c.; and in one, 0·4 c.c. to 0·6 c.c.] A. E. Rook[15] has compared the Sigma with the Wassermann test on 927 specimens, and concludes that the test is simpler and gives more information than the Wassermann in sera.

C. J. Wang[16] has employed a very simple modification of the Sachs-Georgi test. Heart extract made of minced heart muscle 10, with 96 per cent alcohol 30, is diluted to 1–10 by floating on saline, allowing to stand for fifteen minutes, and then rotating very slowly for five minutes, by which time the supernatant extract is turbid and the saline below is clear. The tube is then rotated slowly for ten minutes in an almost horizontal position. In the test proper, place 10 drops of saline from a Wright's pipette in one tube (3 in. by ½ in.) and 4 in another; 2 drops of serum in the first tube; mix; transfer 4 drops from first tube to second; add 8 drops of diluted antigen to each tube; incubate at 37° C. for sixteen to twenty hours. Results parallel with those of the Wassermann test were obtained in 96 per cent of 200 cases. The test gave more positives than the Wassermann.

*Wassermann Tests of General Hospital Cases.*—The frequency with which syphilis is eventually discovered to be the explanation of vague symptom syndromes suggests the advisability of extending the practice common in America of including a Wassermann test in the routine examination of every case admitted to a general ward of any hospital. Frequently by this means syphilis is discovered, and, though not to be taken as necessarily indicating that the patient's symptoms are attributable thereto, is a valuable piece of evidence, the neglect of which might lead the physician or surgeon far astray. R. A. Kilduffe[17] reports on 567 tests on 494 patients carried out in the course of the routine practice in the Pittsburg Hospital to test every gynæcological or obstetric case and about 20 per cent of the general cases. The result showed, in 283 cases presenting various medical and surgical conditions other than obstetric, 47 positive reactions, while the whole series of 494 cases yielded 57 positives, only 20 of which showed clinical or historical evidence of syphilis.

*Cardiovascular Syphilis.*—B. P. Thom[18] has made a study of the blood-pressure of fifty syphilitics, and found it higher than normal for the same ages and sex in 58 per cent. He suggests that this is due to excessive adrenal activity, whether by gross disease or under the influence of increased cholesterin in the blood. He quotes Vedomand, who found a previous history of syphilis in 15 per cent of cases of hemiplegia *after* the age of sixty, a result which agreed with H. A. Thomas's analysis of 740 cases of hemiplegia. Thom concludes that syphilis is an important cause of high blood-pressure and consequent arteriosclerosis. This is apart from its direct action on blood-vessels, causing obliterating arteritis, which makes it responsible for the majority of hemiplegias under the age of forty.

*Gastric Syphilis.*—Numerous reports during the year serve as reminders that no organ is safe from the ravages of syphilis. J. Monges[19] reviews the subject of gastric syphilis. Besides the forms of gastric disturbance due to syphilis of the central nervous system, are others which resemble very closely, in clinical signs, simple ulcer and carcinoma, with resulting perforation or stenosis and various gastric deformities. There being nothing very characteristic in the signs which distinguish gastric syphilis from other gastropathies, he gives again the frequently repeated advice in chronic disorders to think of syphilis and have the blood tested. If the blood is positive, though it may not prove the lesion in question to be syphilitic, it indicates antisyphilitic treatment. This, however, should not be continued too long in the absence of improvement ; the surgeon's help should be enlisted if there is any suspicion of malignant disease. D. J. Galloway[20] has found gastric syphilis much more commonly in Asiatics than the literature would lead one to expect. In regard to diagnosis, he says, " In its power of mimesis of other diseases syphilis runs hysteria a close second ", his own cases having been very presentable pictures of malignant tumour, gastric ulcer, and subacute gastritis. In cases imitating cancer, the pain, though always present, is not pronounced. In those simulating peptic ulcer, vomiting is not usually aggravated by eating ; tenderness is more diffuse, and pain not much increased by food. In regard to hæmatemesis, the author differs from Monges, who says that in syphilitic ulceration hæmorrhages are frequent and abundant, and quotes a classical case of Fournier's in which the patient nearly lost her life twice from this cause, being saved each time by **Potassium Iodide.**

J. W. McNee,[21] in an admirable review of the subject, quotes Turnbull, who, in a discussion following Monod's lecture to the Royal Society of Medicine,[22] mentioned that, in an experience of nearly 13,000 autopsies, he had met with only one case which might possibly be regarded as syphilis of the stomach. Generally the conclusion from this author's review is that syphilis of the stomach is relatively very uncommon. Apart from the comparative rarity of case records, Smithies found only 26 out of 7545 cases of dyspepsia with a positive Wassermann reaction, and only 1·6 per cent of 1603 with definite organic disease of the stomach. Glaser showed that achlorhydria is a feature of syphilitic ulcer, a feature which distinguishes it from the ordinary peptic variety. McNee's own case in which *Sp. pallidum* was found in the gastric tumour after death was mentioned in the MEDICAL ANNUAL, 1922, p. 433.

T. McCrae[23] warns against too strong reliance on the Wassermann test in the diagnosis of visceral syphilis, and the evil of withholding treatment because the reaction is negative. He regards a negative Wassermann reaction as no indication for stopping treatment. He recommends a cautious start with **Arsenobenzol** treatment (except in hepatic syphilis, where he thinks this remedy is contra-indicated), and would give 0·2 grm. '606', or equivalent in '914', weekly for four to six weeks. After this **Mercury** is given, preferably by inunction, for about five weeks ; then two weeks' rest, followed by repetition of the arsenobenzol and mercury. **Iodide** should be given steadily throughout ; 30 or 40 gr. a day is sufficient for most cases, but nerve cases require much more. He would repeat the treatment at least once a year for the rest of the patient's life. A watch should always be kept on the blood condition, lest the remedies be pushed beyond the time when they have begun to cause anæmia.

*Syphilis of the prostate* was found by Warthin[24] post mortem two years after infection. Naked-eye evidence of syphilitic disease of other organs was absent, but the microscope showed infiltrations in meninges, lungs, liver, suprarenals, and testicles. Stimson[25] records three cases of *syphilis of the trachea and bronchi*, with paroxysmal cough, stridor, and dyspnœa.

*Syphilitic Recurrences Precipitated by Trauma.*—J. V. Klauder[26] relates a number of cases in which syphilitic recurrences followed injury to some part of the body, including general paresis subsequent to head injury. He discusses the bearing of the syphilitic factor on claims for compensation, and concludes generally that, while it would be impracticable to examine every workman's blood and reject those with a positive reaction, the general risk from employing a syphilitic person is small except in the case of neurosyphilis. Since a frequent feature of neurosyphilis is pupillary irregularity, it would appear that such cases should be examined in careful detail, and any with positive spinal fluid should not be employed on work of a hazardous nature in which he may receive trauma. [In the reviewer's experience, syphilitic recurrences after the secondary stage are on the site of some trauma in the great majority of cases, though it does not follow that trauma is followed by recurrence in any but a small proportion of syphilitic subjects.—L. W. H.]

## TREATMENT.

Arsenobenzol Compounds.—L. Dub[27] reports on the newer preparation **Neosilversalvarsan**, and judges it to be more active than neosalvarsan but less so than silversalvarsan. He has administered it intramuscularly, and finds that, given by this route, it acts more quickly than when given intravenously. For intramuscular injection he dissolves the dose of 0·2 grm. in a mixture of 1 c.c. of 2 per cent novocain and 1 c.c. sugar solution (equal parts white sugar and water). An $x$-ray shadow of the remedy can be seen for three to four weeks. F. Zimmern[28] agrees with others that neosilversalvarsan is similar in effect to silversalvarsan, and, since it is better tolerated, more of it can be given than of the older preparation. A great advantage of neosilversalvarsan over '914' is that it is comparatively stable, so that solutions can be left standing for a longer time without deteriorating. Zeller[29] has given 1000 injections of neosilversalvarsan to about 100 patients. The injections were bi-weekly, in doses of 0·2 grm. increasing to 0·4 grm. or 0·5 grm., to a total of 10 or 12. The author concludes that the preparation is better tolerated than silversalvarsan, though not quite so active therapeutically. Galewsky[30] concludes that neosilversalvarsan is much more active than neosalvarsan, and is more convenient than silversalvarsan, since it practically never causes vasomotor symptoms. He recommends the simultaneous use of **Mercury** in cases with positive Wassermann reaction, though patients do not tolerate the combined treatment so well.

E. Jeanselme, M. Pomaret, and M. Block[31] report on the effects of aminoarsenophenol, a solution of dioxydiamidoarsenobenzol, the base of '606', in glucose. The preparation, '**Eparséno**', or '**132**', is stable, and therefore convenient in that it can be put up in ampoules ready for use. Its arsenical content is double that of '914'. The individual dose employed was 0·12 grm., but sometimes this was increased to 0·24 or 0·36. The interval between the smaller doses was three to four days, and between the larger ones somewhat longer. The pain following the intramuscular injection was comparatively slight and easily borne, and the injection was not followed by general reaction. On an experience of 150 cases treated during eight months, the authors conclude that 'éparséno' is at least equal in therapeutic effect to '914', and, owing to the fact that it can be given intramuscularly, it is an eminently convenient preparation. P. Bertin,[32] in a thesis describing the advantages of the intramuscular method of administering arsenobenzol compounds, particularly éparséno, suggests that the pain following intramuscular injections of '914' and sulfarsenol is caused by small amounts of formalin or of sulphite, from which éparséno is free. [It is only just to mention that, as far as the reviewer can judge, an exactly similar preparation made by Messrs. Boots under the name of '**Stabilarsan**' has been under investigation at St. Thomas's Hospital for nearly two years. The results have so far been satisfactory, and bear out the conclusions of Jeanselme, Pomaret, and Block regarding the value and convenience of the solution in glucose of '592', the base of '606'.—L. W. H.]

*Combined Mercurial and Arsenobenzol Intravenous Injections.*—Since Linser, in 1919, proposed the intravenous injection of salvarsan and mercury perchloride in one solution, numerous workers have introduced modifications of the mercurial preparation, such as novasurol (Bruck and Becher) and embarin (Herbeck). F. W. Oelze[33] has experimented with Boedecker to discover a mercurial preparation which leaves a clear solution when mixed with salvarsan, and recommends **Cyarsal,** on which he first reported in 1921. Cyarsal is intended solely for use when mixed with an arsenobenzol preparation, and the author does not recommend its injection alone. He gives 0·6 grm. neosalvarsan with 1 to 1·5 c.c. cyarsal. The disappearance of superficial spirochætes after the first injection takes place rather later than after injection of other preparations, but this the author thinks no disadvantage. In fact, he thinks it a disadvantage of salvarsan that it sterilizes the organism too quickly. The mixture of neosalvarsan and cyarsal contains colloidal mercury in a high state of dispersion; this, with its enormous surface, he considers of great value to the mercurial effect. He quotes other workers who have had good results with this combination. F. Hess[34] reports on a number of cases which he treated by the cyarsal-neosalvarsan modification of Linser's method. Out of 13 cases of previously treated secondary syphilis, 3 became serologically negative, in 7 the reaction was uninfluenced, and in 3 it was influenced slightly. The amount of neosalvarsan given was 4·5 grm., and of cyarsal 19 c.c. In 9 cases of untreated syphilis, 6 became negative. He does not think the results so good, in old cases at any rate, as those of the neosalvarsan-sublimate or neosalvarsan-novasurol mixture, but toxic effects are practically nil.

Von Pezold[35] reports on a year's experience of the Linser method of mixing neosalvarsan and mercury perchloride in the same syringe. He gave 3700 injections in 591 courses. The single dose consisted of 1 c.c. of a 1 per cent solution of sublimate mixed with 0·45 to 0·75 grm. neosalvarsan. The dose of sublimate was first diluted with 2 to 5 c.c. distilled water, and the neosalvarsan dissolved in this. The result was an opaque olive-green mixture. The total amount of neosalvarsan per course was 4·5 to 5·4 grm. according to the sex. Amongst other side-effects, jaundice occurred in 3 per cent of cases, and one died of acute yellow atrophy; yet the author concludes that the mixture is well tolerated. Neuro-recurrences were seen in 6 cases, and one other seems to have died of a neuro-recurrence. [This seems to indicate an insufficiency of mercury in the treatment.—L. W. H.] As regards the effect on the Wassermann reaction, it appears that, out of 251 sero-positive cases, the reaction was negative at the end of the first course in only 96, or 38 per cent. The author concludes that the therapeutic effect is not particularly lasting, and this he attributes to the smallness of the dose of mercury. Otherwise he considers it to be the most convenient method of treatment up to date, and that, provided the sublimate can be increased with safety to 2 c.c. of 1 per cent per dose, it is the treatment of the future.

H. Eicke and E. Rose[36] think that the success of Linser's method is largely due to the salvarsan. They regard the method as suitable for those cases which need a little mercury in addition to the arsenobenzol. Vill and Schmitt[37] report further on the effect of the **Combined Silversalvarsan and Novasurol Injections** which they have used for a year and a half, giving over 4000 injections to 271 cases. The combination of the arsenobenzol with novasurol has the advantage over that with mercury perchloride that no precipitate forms. The treatment of primary cases consisted of 10 injections totalling 2 to 2·5 grm. silversalvarsan with 15 to 20 c.c. novasurol, and another course of 8 injections four weeks after the end of the first series. Primary cases with positive Wassermann reaction received 2 to 3 courses, and secondary cases 5. The authors conclude that, as judged by clinical results, and effect on *Sp. pallidum* (which usually disappeared after the first injection) and on the Wassermann reaction, the method of combining silversalvarsan with novasurol in one injection is good. Moreover, it is convenient and free from danger. S. Rothman[38] discusses the chemistry of the Linser method, and shows that the combination of mercury perchloride and salvarsan results in reduction of the mercury salt to a colloidal state, with a negligible amount of oxidation of the salvarsan. The salvarsan is bound physically to this colloid. The colloidal state remains for several hours, so that, under ordinary conditions of working, there is no risk of embolus. A similar process occurs, according to Rothman, in the combinations with novasurol and embarin, but not with cyarsal, in which the mercury is bound faster to the arsenobenzol. The author reports on 242 cases. Spirochætes disappeared quickly after the first or second injection. Clinical results were fairly good, and serological fair. The author judges that the effect is attributable to the mercury. Toxic effects, including stomatitis and albuminuria, are not wanting, and the author concludes that the method, though convenient, does not give such good results as the older procedures.

C. Tollens[39] concludes also that the combination of $HgCl_2$ with neosalvarsan results in colloidal mercury. He has obtained similar clinical results with a colloidal mercury specially prepared and mixed with neosalvarsan. He suggests a use for the neo-sublimate combination in septic processes, and has seen good results in a case of abscess of the lung.

## TOXIC EFFECTS OF ARSENOBENZOL COMPOUNDS.

*The Effect on the Kidney and Liver.*—D. M. Sidlick and M. L. Mallas[40] have investigated the urine and blood in a number of cases receiving bi-weekly injections of silversalvarsan, and agree with Anderson[41] that this drug does not cause functional disturbance of the kidney. This opinion agrees with that of C. Weiss and A. Corson,[42] who have conducted similar investigations in five cases of tertiary syphilis treated with arsenobenzol compounds and conclude that: "(1) Arsphenamin does not exert any selective injurious action on the kidneys; (2) Patients with injured kidneys do not necessarily manifest arsphenamin reactions; and (3) Patients with good kidney function may suffer from severe reactions". The authors give a review of the literature on the subject which supports their own findings.

Whatever the effect on the kidney, an array of workers unite in the conclusion that arsenobenzol compounds damage the liver. Weiss and Corson advance in support of this the increase in total non-protein nitrogen in their cases without corresponding increases in urea-nitrogen of the blood. This condition has been found by Losee and Van Slyke[43] in eclampsia, and by Rowntree, Marshall, and Chesney[44] in various other diseases in which the liver is known to be involved. In the same connection may be mentioned the work of Mackenzie Wallis and of Spence and Brett on liver tolerance of patients receiving arsenobenzol injections, published by the Salvarsan Committee of the Medical Research Council.[45] Both showed that the toxic effect of arsenobenzol on the liver may be demonstrable in greatest force as long as three months after the completion of a course of injections. Acting on this Harrison[46] has followed the suggestion of Professor MacLean to give patients about 50 grm. glucose in a drink about half an hour before each injection. The principle is to fill the liver-cells with glycogen and so to reduce their affinity for arsenobenzol, just as well-fed liver-cells are not poisoned by chloroform. The result has been a very pronounced reduction in the incidence of jaundice amongst the patients so prepared.

*Prevention and Treatment of Vasomotor Symptoms.*—G. Milian[47] outlines the procedure for prevention and treatment of vasomotor symptoms accompanying or following arsenobenzol injections. His advice may be summarized as follows: (1) Full alkalinization of '606', when this is employed; (2) Fractional injection of concentrated solutions, with a pause after each quantum of 2 or 3 c.c. has entered the veins; (3) Rejection of batches of '914' which are prone to cause vasomotor symptoms; (4) Preparation of the patient, who should have an alkaline diet, take bicarbonate of soda drinks or Vichy water, and have rested for quite an hour before each injection. Action should be taken on the first threat of vasomotor symptoms, and the apparatus, an ampoule of adrenalin chloride solution (1–1000), and a sterile syringe, should always be in readiness. When the pulse becomes thready, 1½ mgrm. of adrenalin should be injected into the gluteal muscles. The syringe should then be filled with 4 to 5 c.c. saline, which with the adrenalin adhering to the walls will then contain about $\frac{1}{10}$ mgrm. adrenalin. This should be injected slowly into a vein. The action of this minute dose of adrenalin is described as extraordinarily rapid in reviving the patient, even though he may be almost moribund.

Sicard[48] found that the preliminary injection of sodium carbonate is a valuable means of preventing vasomotor shock; but another method which succeeds even better is to confine the injection to one limb by applying a tourniquet proximal to the site of the injection. The tourniquet is removed slowly five or six minutes afterwards. The method, called by him "tophophylaxis", enabled him to steer a number of susceptible cases through the course without further trouble. A modification of this plan is to inject a fraction of the dose for the tophophylaxis (0·15 grm.), and a few minutes later to give the remainder freely into the circulation. G. J. Busman[49] confirms Stokes[50] as to the value of desensitization by means of a minute intravenous injection of arsenobenzol an hour before the injection proper, and by the injection of atropine. [Compare Sicard, above.] The procedure is to give one-tenth the dose on the patient's arrival; a subcutaneous injection of atropine, $\frac{1}{50}$ gr., twenty minutes later, and the remainder of the dose of arsenobenzol at the end of an hour following the desensitization. A smaller dose of atropine than $\frac{1}{50}$ gr. may easily fail, and this may account for Strickler's[51] lack of success with atropine. The author finds that the first appearance of nitritoid intolerance is, on the average, after the fifth injection. The treatment outlined above is recommended for those patients who repeatedly show symptoms of vasomotor disturbance. Amongst these the author includes persistent nausea and vomiting for several hours after an injection. Duhot[52] recalls that Fleig, of Montpellier, recommended the solution of '606' in glucose for intravenous injection in the acid form. Duhot has found the following method successful in avoiding vasomotor symptoms during injections of '914'. The dose is dissolved in 2 c.c. water in a 20-c.c. syringe, and the syringe then filled with 50 per cent glucose.

*Dermatitis.*—Harnett,[53] employing the course of 2·6 grm. '606' in fifty-seven days which was common in the Army during the war, found that the incidence of dermatitis was much higher with Indian soldiers than had been reported in the British Army. Analysing his cases, he found that drivers and followers suffered more than sepoys, and concludes that the smaller physique of the driver is responsible for the higher incidence. Thus: British soldiers, 0·3 per cent; sepoys, 2·0 per cent; drivers and followers, 5·7 per cent.

*The Effect of Arsenobenzol Dermatitis on Syphilis.*—Many engaged in the treatment of syphilis have thought that cases which develop dermatitis during or after treatment with arsenobenzol show by other signs that their syphilis has been more profoundly influenced by the treatment than cases of the same stages which have received the same dosage. It is perhaps natural to assume that this would be likely, in view of the fact that arsenobenzol acts only in the degree to which it has been decomposed by the tissues, and that there is a rough parallelism between the toxic effect of arsenobenzol and its therapeutic activity. On this theory a patient whose tissues were very active in forming the therapeutic derivative of arsenobenzol would, at the same time that the syphilitic virus was severely poisoned, himself feel more deeply the effects of the remedy. Some support for this theory is contained in the analogous case of atoxyl, those animals suffering from spirochætosis which are more profoundly affected by the remedy being sterilized by smaller doses than those which can tolerate higher doses. On the other hand, the explanation of dermatitis may be an undue susceptibility of the tissues to the arsenobenzol derivative. E. Benveniste,[54] in opposition to Buschke and Freymaner, takes the view that patients who develop dermatitis do not pursue a more favourable course from the point of view of their syphilis than others. He says that the two cases cited by Buschke and Freymaner, found to remain negative two and seven years after a dermatitis following a quite insufficient amount of treatment, might have pursued this course if they had not suffered from dermatitis. One knows that a single injection may on occasion produce a permanently negative serum reaction. Benveniste has turned up the records of 13 cases of dermatitis which have happened in the dermatological clinic of Geneva: 5 have not reappeared; 1 turned up only once, three months later, when his Wassermann reaction was negative; 1 has tabes, and 5 others subsequently either gave a positive serum reaction or showed signs of clinical relapse. The author concludes that the occurrence of dermatitis has no influence on the evolution of syphilis.

[The subject of toxic effects of arsenobenzol compounds is very fully reviewed in the second report of the Salvarsan Committee of the Medical Research Council (Special Report Series No. 66). Since the information contained in this report is very much condensed, it cannot be reviewed with justice in the space available in the ANNUAL.—L. W. H.]

*Deterioration of* '914' *on keeping in Ampoule.*—G. B. Roth[55] tested a number of batches of neoarsphenamin from eighteen to twenty-nine months after issue, and found that, out of 49 from one maker, 13 had become difficult to dissolve, and in 8 out of 25 from another the same change had occurred. Such a change causes the drug to give rise to vasomotor reaction more readily. The author found that heat caused this change to appear more readily, a batch which had been kept at 37° C. for nine months becoming much less soluble, while the same batch kept at 20° C. remained unchanged. Storage in the cold is recommended. This work is highly important, and those who have experienced an undue proportion of toxic effects in their practice might profitably inquire into the conditions under which the drug has been stored.

*The Pharmacological Control of Arsenobenzol Compounds.*—Until recently it has been thought sufficient to ensure by animal tests that arsenobenzol compounds are safe for use before being placed on the market, every batch used in this country being tested in this manner. Certain events led to a suspicion that different brands of compounds might be similar in arsenical content and equally safe, but vary in therapeutic value. The problem was how to decide this point in the case of a given batch before its issue, having regard to the fact that tests must be carried through rapidly. Dale[56] and his co-workers in the Department of Biological Standards, Medical Research Council, have collaborated with White and Mills, Military Hospital, Rochester Row, in an investigation which goes to show that there is a close parallelism between the effect of a given brand of an arsenobenzol compound in causing disappearance of trypanosomes from the blood of mice. and its effect in causing disappearance of *Sp. pallidum* from the secretion of syphilitic lesions. The experiments discovered wide differences between different brands of '914', and led to modifications in the manufacture which resulted in some brands being improved considerably in therapeutic value. It was shown also that there is a rough parallelism between toxic effect on the parasite and on the tissues, a preparation which was very kindly to the tissues being somewhat correspondingly kind to the parasites of syphilis. C. Voegtlin and D. W. Miller[57] have independently arrived at the same conclusion as Dale, White, and respective colleagues regarding the value of the trypanocidal test as a practical index of the therapeutic activity of arsenobenzol compounds. Experiments were made on rats, while '606' was constant, '914' varied considerably in value according to the make.

Mercurial Treatment.—*Intravenous Injections.*—J. E. Lane[58] again recommends the intravenous method of administering mercury first introduced into this country by himself in 1895. The plan followed by the author since 1917 in the case of 166 women has been to give 1 injection of arsenobenzol and 5 of a 1 per cent solution of mercury cyanide, the dose of the latter being as great as 50 min. in tolerant cases, an average of about 40 injections being given. The author does not recommend the treatment for out-patients.

*Mercurial Inunctions without Persistent Soiling of the Skin.*—Cole, Gericke, and Sollmann[59] tested the effect of removing excess mercury after inunction of 4 grm. for thirty minutes, and found in a series of 44 cases salivation was produced in 32 in from five to twenty-three rubbings. with an average of fifteen. This they find is no different from the results when mercury is left on the skin. The conclusion is that it is unnecessary to leave the patient's skin soiled with mercury; the excess may be removed with cotton-wool soaked in benzene, and a great disadvantage of the inunction treatment is thereby removed.

**Mercurosal.**—L. G. Hadjopoulos, R. Burbank, and L. P. Kyrides,[60] after discussing the disadvantages of the mercurial compounds in common use, report on the results of treatment with a new compound prepared by one of them. This is the disodium salt of mercury salicyl-acetic acid, and is called mercurosal. It is a white powder containing 40 per cent of mercury, giving a neutral or faintly alkaline reaction. It is one-eighth as toxic as $HgCl_2$, and a safe dose is 0·05 to 0·1 grm., repeated twice a week for ten injections, and followed by a rest of a week or two before the next course. The compound should not be brought in contact with alcohol, since thereby a toxic compound is formed, giving rise to symptoms similar to those following arsenobenzol injections. The routine treatment was a monthly course of one or at most two arsenobenzol injections and about ten mercurial. A series of case-records are included in the report, but they are not impressive, and the progress of one case in which mercurosal given alone for two months failed to influence symptoms does not seem to indicate a very powerful antisyphilitic effect. At the same time the authors claim that their results were better than when mercury salicylate was employed in doses of 0·06 grm. weekly.

*Prevention of Mercurial Stomatitis.*—Heermann[61] recommends for the prevention of mercurial stomatitis: (1) Discard the toothbrush, which damages the gums and so predisposes to stomatitis; (2) Rub the gums with cotton-wool wrapped round the fingers; (3) Wash out the mouth frequently during the day; and (4) At night apply a tampon of gauze between the gums and cheek and the gums and tongue, leaving the tampons all night. The tampon absorbs the saliva, which contains mercury, and prevents it acting on the gums. The author states that, in twenty-eight years during which he has employed this tampon of gauze, he has not had a case of mercurial stomatitis, though he has employed inunctions most intensively, and that sometimes on patients who under ordinary methods of prevention had experienced soreness of the gums after a single rubbing.

Results of Treatment.—Newcomer[62] gives the results of further observation of a number of patients treated with **Arsenobenzol.** Combining his results with those of Anderson,[63] he finds 66 per cent of 23 cases of primary and secondary syphilis with what appears to be a permanently negative Wassermann reaction after an average of 12·5 grm. salvarsan. given in about seventy-five weeks. The author thinks his statistics show that time plays a very important part in the treatment. In primary and secondary syphilis the treatment should spread over about a year; in tertiary cases, over a much longer period—two or three years.

The Intractable Wassermann Reaction.—It is well known that many late cases of syphilis give a positive Wassermann reaction which is particularly difficult to convert; so much so that many assert that the task is impossible, while others maintain that a late positive Wassermann reaction is of no moment, indicating merely that the patient has at some time suffered from syphilis. Against both these views are those of others who hold that the Wassermann reaction in these cases can be changed by treatment, and that treatment is indicated, since expert examination (*see* Stokes and Busman, Medical Annual, 1922, p. 422) shows a high proportion with active disease of the cardiovascular or the nervous system, if not of the viscera. S. Feldman[64] has treated a number of these late cases for considerable periods, and concludes: "The physician, not being able to follow many tertiary patients to a successful result, has developed the idea of the Wassermann-fast patient. Glancing over our records, I find, however, that a number of patients with tertiary lues, whose blood remained positive for years, in spite of the fact that they were uninterruptedly under treatment, became negative after ten or more courses or a period of approximately five years of treatment. It is gratifying to note that, once a negative reaction is obtained in these cases, it usually remains so, provided treatment is kept up". As showing the importance of treating old cases of syphilis with a positive reaction but no outward signs, Faber[65] found 24 such cases in 1356 inmates of a hospital, and traced 9 out of the 24 six years after discharge from hospital. One had aneurysm of the aorta, three had sensory disturbances of the feet, and one had early tabes, so that Faber is strongly in favour of treating latent syphilitics.

## SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.

*The Effect of Systemic Syphilis on Incidence.*—Many observers believe that severe systemic syphilis protects the central nervous system. In support of this belief is the rarity of systemic manifestations in the history of tabetic and paretic cases; while in animals, Brown and Pearce's experiments indicate that, if the development of the primary syphilitic lesion is hampered, the brunt of the infection tends to fall on the eyes, and possibly the central nervous system. F. Plaut and P. Mulzer[66] record some interesting experiments which seem to the reviewer to bear on the same problem. They showed first that syphilitic changes in the central nervous system of rabbits could repeatedly be demonstrated by Plaut's puncture through the foramen magnum and drawing off a little cerebrospinal fluid. In 38 uninfected rabbits the Wassermann, globulin, and cell tests gave negative results. In 22 syphilitic rabbits, 8 were found to have pathological fluid, i.e., cell increase in 3, globulin increase in 1, and both cell and globulin increase in 4. Continuing their research, the authors sought to ascertain how soon after infection the cerebrospinal fluid showed signs of central nerve involvement. The animals were infected by two different strains of *Sp. pallidum*, and the results were interestingly different. One strain was originally from the blood of a secondary syphilitic, and had been passed through twelve rabbits. Injected into the testicles of four rabbits, it caused lesions only after four weeks, and these of only moderate severity; three rabbits showed changes in the cerebrospinal fluid in five weeks, and the fourth after two months. The other strain had been passed through 225 rabbits. When injected into the testicles of 5 rabbits, it caused lesions to appear in ten to fourteen days, and these were severe, with orchitis and periorchitis and marked ulceration. Only one of the rabbits showed changes in the cerebrospinal fluid, and those not until two months had elapsed. It seems clear that the two strains were widely different in their primary effects, and that the effects on the central nervous system were inversely proportional to the primary. The explanation might be that one strain was neurotropic, but it was originally obtained from the blood of a secondary syphilitic. Plaut, in a recent answer to a private inquiry by the reviewer, says that the difference in the effects of the two strains still continues, but the first mentioned has as yet reached only its seventeenth passage. The more attractive explanation is that the other strain, owing to its numerous passages through the testicles of rabbits, had become increasingly virulent, and the violence of the initial process had resulted in a greater production of immune substances protecting the nervous system.

*General Paresis and Tabes in Turks.*—It is a common belief that Arabs and Turks do not suffer from tabes and paresis. Hagelstam[67] reports that this has been disproved by Fleischmann's experience during two and a half years in Turkey during the war. Previously it has been considered a religious duty to keep the mentally sick away from infidel physicians; but this broke down somewhat owing to the war. A Japanese reported a somewhat similar experience at a recent congress of neurologists in Paris.

*Neurosyphilis in Coloured People.*—A. Pijper[68] carried out 500 Wassermann tests on natives and their friends and relations attending the Pretoria Hospital. The results showed that at least 36·8 per cent were certainly infected with syphilis, and a further 11 per cent probably so. E. L. Zimmermann[69] compares the effect of syphilis on whites and coloured people attending the Johns Hopkins Hospital. He quotes Heim, whose studies in German East Africa showed that secondary manifestations are often severe and frequently recurring, while tabes is very infrequent, only 7 cases being discovered. Lambkin[70] found that the chancre often became phagedænic, ulcerative lesions were very common, and neurosyphilis was rare. Baetry,[71] in 500 cases, found 50 cases of aortic disease. Cerebral hæmorrhage (? thrombosis) occurred in 51 cases, and cranial nerve palsies in 12; but in 29,000 admissions there was no case of tabes and only one of paresis—in a Columbian negro of Indian type. Zimmermann's studies are based on 1843 cases, of which 596 were white males, 297 white females, 521 coloured males, and 429 coloured females. Generally the age of infection was one or two years earlier in coloured subjects, over 50 per cent of the females being infected before the twenty-first year. Those with secondary syphilis showed more iritis and osteo-arthritic signs and pustular syphilides. Tertiary lesions of bone were commoner, also cardiovascular syphilis, rectal stricture, and elephantiasis vulvæ, while leucoplakia was uncommon. Tabes and paresis were much less common, but syphilis of the supporting structures of the central nervous system occurred with about equal frequency in blacks and whites.

*Neuro-recurrences following Arsenobenzol Treatment.*—E. L. Zimmermann[72] has analysed the cases of neuro-recurrence following treatment in 7065 syphilitic patients. Of the 400 cases of primary and secondary syphilis, the number which developed neuro-recurrences was 23, a proportion of 1·64 per cent. In addition, he found 16 others who had been treated elsewhere. The arsenobenzol treatment had consisted in 4 cases of one dose; 7, two doses; 2, three doses; 1, four doses; 4, five doses; 16, six doses; 2, seven doses; and 1, twelve doses, so that 34 cases had received six doses or less. Only 3 of the author's own 23 cases had been treated with mercury. In 15 out of 26 cases analysed the nerve affected was the auditory, while the facial was involved in 14. The pathology of a neuro-recurrence is a syphilitic meningitis with or without focal lesions which damage one or more cranial nerves. The prevention of neuro-recurrences lies in a sufficient initial treatment. The author supports the view that mercury prevents neuro-recurrences, and this accords with the reviewer's experience, in which neuro-recurrences have been confined practically to cases treated solely with arsenobenzol, and that in comparatively small amounts. In the reviewer's treatment centre no neuro-recurrence has occurred for almost three years, and it seems reasonable to attribute this immunity partly to the fact that the programme of treatment is a long one, and partly to the simultaneous use of mercury. When the latter remedy is withheld until the first course of arsenobenzol has been given, the risk is that the patient may default before the mercurial treatment commences.

*Colloidal Benzoin Test of Cerebrospinal Fluid.*—H. Dible[73] obtained a positive reaction in a case of septic meningitis, and ambiguous reactions in seven non-specific cases. He concludes that a positive reaction probably indicates syphilis, while an ambiguous reaction means merely a pathological fluid but does not determine its nature.

*Prognostic Significance of Negative Cerebrospinal Fluid.*—In deciding on the question of cure in syphilis it is important to know at what period after infection a negative spinal fluid can be regarded as good evidence that the patient will not in future suffer from neurosyphilis. Fordyce[74] has stated that if the spinal fluid is once found negative after treatment, the probability is that the central nervous system will not be invaded. U. J. Wile and C. H. Marshall[75] stated that in several thousand cases in which lumbar puncture was performed, positive fluid was found in only three cases previously found negative. J. E. Moore[76] subjected 54 cases with negative fluid to re-examination at intervals of a few months to five years following the first test. Positive results were obtained in two. The first was a case of gumma of the inner table of the cranium in which the patient later developed right facial paralysis; and coincidently there were 112 cells, and strongly positive globulin and Wassermann in the cerebrospinal fluid. In this case the meninges were invaded directly. The second case was one of secondary syphilis treated from March to May with six injections of arsenobenzol, and found to have a negative fluid two weeks after the sixth injection whilst on mercurial inunction. He remained more or less irregularly under treatment until November in the following year, relapsing once in the meantime with moist papules on the penis. In November, 1920, his fluid gave a strongly positive Wassermann reaction, paretic gold and mastic reactions, positive globulin, and 37 cells.

It appears to the reviewer that at the first examination the fluid may have been only temporarily negative as a result of treatment. The history does not, in fact, prove that the patient's nervous system had ever been sterilized.

It seems more reasonable to regard the reactions of the cerebrospinal fluid as one does those of the blood, venturing no opinion as to the future on negative reaction very shortly after infection or termination of treatment, but becoming more confident the longer the time which has elapsed since suspension of treatment. This view is supported by the following: H. C. Solomon and J. V. Klauder[77] quote Nonne's discussion of the significance of spinal-fluid tests in relation to neurosyphilis, and would add to his five types one in which the disease is active and progressive though the fluid changes are nil or very mild. Nonne's five types are as follows: (1) Fluid normal from the beginning—a rudimentary process; (2) Fluid at first pathological becomes normal—healed neurosyphilis; (3) Fluid improves but does not become entirely normal—disease process improved; (4) Fluid continues pathological, but clinical picture remains stationary; (5) Fluid continues pathological, and disease process increases. The authors' cases in support of their views include some of the vascular type, the most frequent to show negative fluid; some of apparently active tabes; two of cranial nerve palsy; one of cerebral gumma; two of epilepsy, which was probably syphilitic; and one of Erb's spastic paraplegia. They show also that the spinal fluid, like the blood serum, may be reduced to negative by treatment, though later events prove the disease to be still active. They cite in illustration a case of syphilitic meningitis in which the fluid was reduced to negative, but a few weeks later the patient died shortly after a convulsion. The fluid was negative just before death, but the necropsy showed meningitis with lymphocytic infiltration of the pia mater. In another case the patient commenced to show symptoms of general paresis in 1916. He improved under treatment and returned to work, his spinal fluid two years later being negative. A few months after this the fluid returned to positive, and the patient showed clinical signs of relapse. Treatment caused a second remission and a return of the fluid to normal, but whilst still under treatment he relapsed again both clinically and with positive fluid. Such cases as these make it very difficult to determine the question of cure.

*The Mode of Action of Intrathecal Injections.*—As is well known, there is no consensus of opinion as to the mode of action of intrathecal injections. Some believe that the remedy introduced into the spinal canal comes into contact with the virus in the parenchyma of the central nervous system, while others attribute the good effects of intraspinal therapy to such non-specific actions as irritation of the meninges or lowering of the intrathecal pressure, making easier the penetration of the remedy (which has also been injected intravenously) to the parenchyma.

Some light on the discussion seems likely to be thrown by the work of J. Wynn,[78] who acted on the investigations of Weed and McKibben[79] and of Foley and Putnam,[80] showing that the introduction of hypertonic salt solution into the peripheral circulation of cats causes a prolonged fall of the intrathecal pressure, with the result that substances like iron salts given intrathecally were found later in the interfibrous spaces of the white matter and the pericellular spaces of the grey. Wynn treated a number of patients with intravenous injections of 200 c.c. of 15 per cent salt solution, and found that in thirty minutes the intrathecal pressure had dropped 80 to 100 mm. water below normal. Sixteen patients suffering from neurosyphilis were then treated with a series of intravenous injections of 200 c.c. 15 per cent salt solution each during the hour following intrathecal injection of an arsenobenzol preparation. The salt injection caused marked facial flushing and sense of heat in the body and limbs, and intense occipital or frontal headache, the latter of about twenty minutes' duration. There was also intense dryness of the throat. The result of the experiment showed no better results from the addition of the intravenous sodium chloride to the intrathecal treatment. It appears to the reviewer that this experience, as far as it goes, is evidence against the theory that intrathecal injections act by virtue of the injected substance being brought into contact with the syphilitic virus in the parenchyma of the central nervous system, since, judging by the animal experiments, the intrathecally injected arsenobenzol is likely to have been brought more closely into contact with the parenchyma as a result of the intravenous injection of hypertonic saline than under the ordinary conditions of intrathecal therapy. The gap in the evidence is the possibility that in man the cerebrospinal fluid with its contained medicament flowed out more rapidly along the normal channels for the excretion of cerebrospinal fluid. The concentration of the remedy in the cerebrospinal fluid as a result of reduction of the latter seems likely to have been the reason for the aggravation of root pains which occurred in these cases. The author concludes that intravenous injections of hypertonic saline are of no value in the treatment of neurosyphilis. On the other hand, B. C. Corbus and his colleagues (*see below*) have attacked the question in another way, in an attempt to ascertain whether hypertonic saline assists the penetration of intravenously injected arsenobenzol to the brain. Their results appear to indicate that hypertonic saline has this action.

*Treatment of Neurosyphilis by Spinal Drainage without Lumbar Puncture.*—Gilpin and Earley[81] suggested in 1916 that drainage of spinal fluid was a means of inducing penetration of arsenobenzol into the brain; various writers have reported well on this method as a substitute for introduction of salvarsanized serum directly into the subarachnoid space. Spinal drainage through a needle involves, however, a lumbar puncture with its attendant disadvantages. The work of Weed and McKibben, mentioned above, suggested to B. C. Corbus and colleagues[82] a method of performing spinal drainage without lumbar puncture, and of inducing penetration of arsenobenzol into the central nervous system. The patient was put to bed for two hours before treatment commenced. Then 100 c.c. of 15 per cent salt solution was allowed to flow slowly into a vein. Following this injection the patient experienced a feeling of warmth, and the pulse was accelerated, but there was no untoward reaction beyond some thirst. After six hours, during which no food was given, 0·9 grm. '914' was injected intravenously. This was the time when the cerebrospinal fluid internally drained by the hypertonic injection began to be re-formed. The patient remained in bed for five more hours, and then went home. After five such weekly treatments, specimens of cerebrospinal fluid were examined, with the result that arsenic was found in 26 out of 28 cases, a higher proportion than had been obtained by any other method. It is claimed that it is free from untoward effect.

*Intraspinal Treatment.*—E. N. Boudreau[83] reviews current opinion on the value of intraspinal treatment, and concludes generally that it is valuable, but best reserved for cases which do not respond to ordinary methods of treatment. It is interesting to see, amongst the results credited to intraspinal injection, the improvement in bladder symptoms in ataxia. [The reviewer has more than once seen these effects within twelve hours of a simple lumbar puncture without injection of any kind.—L. W. H.]

R. Hearn[84] reports well on the effect of spinal drainage combined with intravenous therapy in 100 cases of neurosyphilis treated at the London Lock Hospital. Seventeen patients of the meningeal, interstitial, or late secondary type were restored to health except for tinnitus aurium in one case of neurorecurrence. Cases of parenchymatous neurosyphilis also were benefited subjectively, but no change was effected in the cerebrospinal fluid. In fact, in four of the tabetics this was normal, though the clinical signs were typical, and improvement followed the treatment. General paretics were improved, provided that they were brought under treatment before they had become obviously stupid and fatuous. In the latter case treatment seemed to hasten the process. The drainage was carried out every fortnight, and injections of maximum doses weekly, eight injections and four tappings constituting a course. One or more injections of intramine were also given. Following this, iodide was administered (with mercury if the case was meningeal), and the course was repeated in two or three months' time if the patient felt no better or symptoms returned. Patients were able to go about their business immediately after each tapping; headache was rare, and generally only in cases where the fluid was normal.

L. W. Harrison[85] relates a case of general paresis treated with enormous doses of **Silversalvarsan** (8·5 grm. in 10 injections) and drainage. Improvement was very marked, so that the patient was able to leave the asylum and lost most of his delusions. Contrary to Hearn's experience, this patient's spinal fluid became normal. [The patient just referred to continues to improve, so that no special attendant is required for him. His speech is, however, still somewhat affected, and though nobody unacquainted with his history would note any exceptional dullness, his intellect is definitely blunter than before he first showed mental signs. Possibly the condition is analogous to the result in diffuse syphilitic hepatitis, where the disease may be arrested, but the outlook is poor because of the scarring which follows. Other cases of general paresis treated by the reviewer on the same lines have improved, but one became too violent to be safe outside an asylum; though quite insane, this patient shows no sign of increasing paresis in tongue, lips, or speech.—L. W. H.]

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## SYPHILIS, HEREDITARY, OF THE EAR. (*See* Ear.)

## TABES DORSALIS. (*See* Spinal Surgery.)

## TESTICLE, SURGERY OF.

*Sir John Thomson-Walker, F.R.C.S.*

Sievers[1] describes a new method of dealing with a *retained testis* with a short spermatic cord. By experiment on the cadavera of children, he found the shortest and simplest method was to bring the testicle and cord through the intact bony ring of the obturator foramen. After separating the testicle from the processus vaginalis, it is brought along with the cord down into the pelvis and out through the median segment of the obturator foramen and thence into the scrotum. This operation he has so far performed only on the cadaver.

Pannett,[2] in a paper on the treatment of the imperfectly descended testicle, considers that our present knowledge of this condition points to the lack of some hormone as being the cause of the imperfect development of the organ in such cases. He thinks that the future treatment will be the provision of the missing chemical stimulus, but until then we must employ methods which fall short of this ideal. He draws a sharp distinction between the testicle arrested before it has emerged from the inguinal canal (imperfectly descended testicle), and the testicle which, after passing through the external abdominal ring, is diverted to some abnormal situation (ectopic testicle). Whereas the latter may be histologically and functionally a normal organ, the former, although producing an internal secretion necessary for the development of male characteristics, may never produce spermatozoa, and, if it does, this may be for one or two years only.

Treatment of the imperfectly descended testicle lies between **Orchidopexy** and **Orchidocœlioplasty.** The former is the procedure of choice when it is possible without prejudicing the subsequent development of the organ, as is usually the case with the ectopic testicle. This, however, does not apply to the imperfectly descended testicle, because, although it is often possible to bring down and fix in the scrotum many such testicles by division of the spermatic vessels, the author has shown experimentally that the organ so treated becomes converted into a useless appendage, not only devoid of spermatogenetic function but also incapable of producing an internal secretion.

The alternative to the above operation is orchidocœlioplasty—replacing the testicle in the abdomen intra- or extra-peritoneally. The objections to this are : (1) That sections of retained testicles with rare exceptions show little evidence of spermatogenesis ; (2) That testicles placed in the scrotum frequently increase in size and function normally ; (3) That, experimentally, abdominal replacement causes testicular atrophy.

It is true that the retained testicle maintains the fœtal characters histologically ; but this may be, not because of its position, but because of the congenitally deficient impulse to development. The fact that testicles placed in the scrotum frequently develop normally, is simply an expression of delayed development, for a certain number of retained testicles descend late and become normal organs finally. As regards the third objection, the author has repeated the experiments of Griffiths, showing that the replacement of a retained testicle into the abdomen will destroy any prospect of ultimate spermatogenesis ; while it will not interfere with the internal secretory functions. The author's explanation of this finding is that the seminal tubules are unable apparently to secrete against the high resistance imposed by the passage through the coni vasculosi and epididymis, unless they are aided by the contractions of the cremaster muscle. The internal secretory cells, whether they be in the interstitial tissue or in the tubules, are not so affected, their secretions finding outlet through the circulation.

The practical application of the above is that, after abdominal replacement, while spermatogenesis cannot be hoped for, internal secretion can be relied on. Whether this operation is performed or not depends upon a consideration of the fact that an inguinal testicle may only be delayed in its descent, ultimately passing into the scrotum to reach full development. Thus, if such a testicle were placed in the abdomen, all hope of spermatogenesis would be lost, and for this reason it is wise to postpone operation until eight or twelve years of age, unless an indication such as the presence of pain, due either to partial torsion or to muscular traumatism, demands early interference, since torsion or traumatism leads to fibrosis of the organ.

A bubonocele is not an indication in itself, and in any case up to four years of age no truss should be worn ; but a large hernia or symptoms of strangulation make early operation imperative, abdominal replacement being the method of choice.

Orchidocœlioplasty is to be preferred to orchidopexy with division of the spermatic vessels, etc., or to orchidectomy, in the treatment of imperfectly descended testicles, once operation has been decided upon.

Schultz and Eisendrath[3] discuss the histogenesis of *malignant tumours* of the testicle. In malignant tumours of the testicle, heterologous tissues may be present or absent ; if present, the teratomatous nature is established ; if absent, the tumour may or may not be derived from a teratoma. In malignant teratoma the atypical tissue usually has a glandular character suggestive of its derivation from hypoblastic epithelium. In a certain proportion of tumours without heterologous tissue, the atypical tissue is of the same glandular characters, and such tumours are derived from hypoblastic epithelium, the proliferation of which has suppressed or overgrown such teratomatous structures as may have been present, or the malignant proliferation may have begun so early that differentiated mixed tissues were not formed. In another group of tumours, the atypical tissue may have the characteristics of chorionic epithelium. In about 50 per cent of the reported tumours of this group, heterologous elements were present and established their teratomatous origin. In a small group of tumours, origin from the epiblastic constituents of a teratoma appears probable. The atypical tissue may have the structure of basal-cell carcinoma or of neurocytoma.

Barringer and Dean[4] discuss *teratoid tumours* of the testicle, with special reference to their treatment by **Radium.** As regards the pathology of these tumours, they quote Ewing, who classifies them thus : (1) Adult embryomas or teratomas, a relatively small group ; (2) Embryoid, teratoid, or mixed tumours, more frequent than the first ; (3) Embryonal malignant tumours, these being most often seen. Diagnosis is often very difficult. In typical cases the whole testicle is an irregular hard mass, in which no distinction between the testicle and the epididymis can be made out. In such, the main diagnosis is between teratoma and gumma, and in a large number of the latter they found a positive Wassermann in each, whereas only one patient with a teratoma gave a positive Wassermann test, and he also had syphilis. They consider pre-operative diagnosis to be very important, for they have never seen a patient in whom the tumour was incised for diagnostic purposes or as the result of mistaken diagnosis, e.g., hydrocele, spermatocele, epididymitis, etc., that did not develop a local recurrence. When the teratoma occurs in an undescended testicle the diagnosis is still more difficult.

The authors comment on the inefficiency of present operative methods. In 19 post-operative recurrent cases, orchidectomy had been performed in 18. There were 8 recurrences in the groin along the spermatic cord, 7 in the abdomen along the spermatic lymphatics, and 4 in the lungs. In 6 more than one region had become involved. As regards the more radical operation, they quote Hinman as having removed the testicular tumour and dissected the fascia around the spermatic vessels up as high as the kidney. In one of the cases there was a secondary tumour of one of the perispermatic lymph glands; this was dissected out, and the patient lived for some months after, apparently well.

The authors treated early cases, after careful examination, including an $x$-ray of the chest, to exclude local extension and distant metastasis, by exposure of the testicular tumour, spermatic cord, and the abdomen along the line of the spermatic vessels to the radium pack. The dose over the testis is usually 12,000 millicurie hours at 6 cm. distance, the filtration being 2 mm. of lead. The same dose is considered sufficient for the other regions. They find that rapidly-growing cellular and more malignant types are much more sensitive to radium than tumours in which adult tissue predominates. Rapid reduction in size after irradiation thus indicates the former type, and in these, operation is delayed weeks or months to get the maximum effect of the irradiation. In tumours which do not decrease in size after exposure, they operate in from three to six weeks after the exposure to the pack. They advocate the complete operation with removal of lymphatics as high as the kidney. They have performed this operation eight times with no post-operative deaths, and do not believe it to be a serious operation if infection does not occur. From three to six weeks after the wound has healed, radium packs are again applied over the length of the scar.

The results of 36 cases of teratoma testis treated during the past four years were as follows:—Three seen before operation, which showed on examination neither such local extension, nor metastatic involvement, as to preclude complete operative removal of these. One is alive without recurrence nine months after being first seen. One is dead, and one has been lost sight of.

Eight seen before operation, but signs of metastasis were present. Of these, 3 are alive forty-one, three, and two months after being first seen; 3 are dead, and 2 have been lost sight of.

Nineteen cases of post-operative recurrent teratoma treated surgically elsewhere. Of these, 5 are alive twenty-eight, eighteen, seventeen, twelve, and three months after they were first seen; 8 are dead, 6 have been lost sight of.

Six cases operated upon elsewhere, but referred to the authors before recurrence had been observed. Of these, 2 are alive nine and two months after they were first seen, 2 are dead, and 2 have been lost sight of.

The extreme malignancy of teratoma testis is shown by these statistics; but the authors believe that radium is a very valuable adjunct to operation in dealing with this disease.

Lichtenstein[5] states that in four cases in which he *implanted a testicle in the scrotum* after the resection of a tuberculous testicle, the inflammatory testicle was cast off and absorbed. In another case, in which both testicles had been destroyed by a shell wound, presenting typical symptoms of total castration, he slit a testicle and implanted each half separately on scarified muscle tissue in the inguinal region. The results in this and in twenty-one other cases since 1915, show that this technique offers favourable conditions for the continued functioning of the implanted testicle for years. Implantation in the scrotum is far less favourable for vascularization. The implant may be derived from an operation elsewhere, being kept on ice for several hours if necessary. A father or brother will sometimes give a testicle for this purpose, especially when it is explained that only a half or a third of the testicle is required. A retained testicle from another person who has one normal testicle can sometimes be utilized.

Kenneth Walker,[6] in a paper on the diagnosis and treatment of *sterility* in the male, states that the male is frequently responsible for a sterile marriage, and, if male sterility is to be excluded, something more than a search for gross abnormalities must be made. A careful overhauling of the genital tract and an analysis of the seminal fluid is necessary. The following points are of importance in the examination of the seminal fluid. The specimen should be fresh. The optimum temperature for the conservation of motility is comparatively low, about 27° C. A week's abstinence from sexual relations must precede examination. If the first specimen is abnormal, at least two subsequent examinations must be made before reporting adversely.

To be regarded as satisfactory the semen must contain plenty of well-formed mobile spermatozoa, and show no abnormal elements such as pus-cells indicating an unhealthy condition of the genital tract. In estimating the fertilizing capacity of the semen, the character of the spermatozoa, their number in an average field, the percentage of those perfect, imperfect, or deformed, and of those that are mobile, with the degree of mobility and the time during which mobility persists, must be ascertained. Any condition causing impairment of health diminishes the number of spermatozoa in a given ejaculation, but especially inflammatory conditions of the genital tract and their sequelæ. sexual excesses. certain functional and organic diseases of the nervous system, and chronic alcoholism.

The consistent absence of spermatozoa from the semen may be due to mechanical obstruction in the genital tract, or to absence of spermatogenesis in the testicle. Obstructions are usually found at the lower pole of the epididymis or in the ejaculatory ducts, almost always the sequelæ of old inflammatory reaction, in 60 per cent of cases due to gonorrhœa. Next in importance in this respect comes tuberculosis. Syphilis is of less importance, because it tends to be unilateral, to involve the testis rather than the epididymis, and to clear up with treatment. Examinations should include posterior urethroscopy, for inspection of the orifices of the ejaculatory ducts. If doubt exists as to their patency, methylene blue is injected into the vas on each side, and its passage into the urethra observed. If no obstruction is observed, the absence of spermatozoa in the semen probably indicates lack of spermatogenesis, and to confirm this the testis may be punctured and search made for spermatozoa in the fluid drawn off in a fine hypodermic needle, several of these examinations being made.

Aspermatogenesis occurs when the tubules have atrophied as the result of a severe orchitis, e.g. mumps ; it is also found associated with various mental conditions, in some cases of cryptorchism, in any advanced malignant disease, and occasionally in chronic alcoholism. Dead spermatozoa or abnormal forms without heads, large or small headed, or double-headed monsters, are usually seen in inflammatory conditions of the genital tract, so that pus-cells will be found associated ; also excess of crystals and amyloid bodies ; such findings call for careful examination for prostatitis and vesiculitis.

The rôle of the accessory glands is doubtful ; but it is certain that they have considerable influence on fertility, their secretion not only adding bulk to the semen, but providing a fluid favourable to the survival of the spermatozoa subsequent to emission, and for this reason the prostate and vesicles should be carefully examined in these cases.

As regards treatment, azoospermia due to the occlusion of the ejaculatory ducts is dealt with by treating the prostatitis usually associated with it, together with, if necessary, catheterization of these ducts. For bilateral epididymitis producing obstruction, vaso-epididymostomy may be performed, provided that spermatogenesis has been proved by direct puncture of the testis. For oligo- or necrospermia due to vesiculitis, prolonged massage and dilatation must be carried out. When spermatogenesis is defective or lacking, treatment is of less value ; the habits, mode of life, and general health are attended to, and a course of orchitic or lymphatic-gland extract may exert an influence on the defective function of the testicles. Occasionally aspermatogenesis is found in men who otherwise appear to be perfectly normal.

References.—[1]*Deut. Zeits. f. Chir.* 1920, cxl, 159 ; [2]*Lancet,* 1921, ii, 379 ; [3]*Arch. of Surg.* 1921, ii, 493 ; [4]*Jour. Amer. Med. Assoc.* 1921, Oct. 15, 1237 ; [5]*Zeits. f. urol. Chir.* 1921, June 13, 305 ; [6]*Lancet,* 1921, ii, 228.

## THROMBOSIS. (*See* Vascular Surgery.)

## THYROID DISEASE.

*Herbert French, M.D., F.R.C.P.*

*Hearts in Hyperthyroidism.*—In an original article Hamilton[1] gives some excellent clinical notes. He divides these cases into two groups : (1) Those which show no evidence of heart damage ; (2) Those which have definite heart changes.

The first class is much the larger. The rhythm of the heart-beat in these shows nothing abnormal but a simple tachycardia ; the ratio varies in normal direction with rest, exercise, vagal stimulation, etc., and is otherwise regular. Systolic murmurs are the rule, but in the absence of other signs are not in themselves evidence of heart damage. True signs or history of heart failure have not been found in this class. The writer has himself watched three cases die : two of pure hyperthyroidism, neither showing any signs of heart failure, while the third died of bronchopneumonia without signs of heart failure. He considers that when cases in this class are cured of hyperthyroidism they are left without demonstrable evidence of heart damage.

The second class consists of (*a*) a small number of patients with rheumatic heart disease and hyperthyroidism added, (*b*) a larger number with definite hypertrophy and either paroxysmal or established auricular fibrillation, but no evidence of rheumatic or other heart affection. Signs of heart failure have been seen in this group. A number of cases of hyperthyroidism have auricular fibrillation as a more or less direct result of hyperthyroidism. The average age of these cases is twenty years greater than the average age of all cases of hyperthyroidism. A history of repeated tonsillitis or rheumatic fever is commoner among the cases of hyperthyroidism with auricular fibrillation than among those without it. Many of these cases are relieved of their fibrillation by digitalis after operation has removed the hyperthyroidism ; and further, they stand operation well when no true signs of heart failure have developed.

Reference.—[1]*Boston Med. and Surg. Jour.* 1922, Feb. 16, 216.

## THYROID SURGERY. (*See also* Medical Annual, 1922, p. 465.)

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

The surgical aspect of derangements of the thyroid gland is always attractive. In children, removal by operation or destruction of the thyroid gland from disease reduces greatly the rate of metabolism. Characteristic changes occur, which are well known, including arrested development of the osseous system. The results are the same in adults, except that the skeleton is already developed.

Cretinism is not usually recognized early. When recognized, nothing very dramatic is brought about by the administration of thyroid extract or its active principle. Myxœdematous patients who once had a functionating gland benefit in a marked degree by the administration of thyroid gland extract. The wonder is, after operations for removal of goitre, that myxœdema is so seldom seen. It is stated that tetany occurs more commonly, but it also is rare.

Judd[1] calls attention to many of these points. He states that tetany more often occurs after secondary operations following partial thyroidectomy. He makes the interesting observation that one or two cases of gastric tetany following gastro-enterostomy made the same response to treatment as that following treatment for tetany with goitre.

The symptoms almost always begin with a stiffness in the fingers, about the third day after operation. These symptoms may pass off in a few hours, or become progressively worse, involving the hands and the arms, or becoming general. Judd mentions that in a series of 20 patients with tetany following operation, there was no death. All patients should be given intravenous injections of calcium lactate, 10 c.c. of 5 per cent solution in 100 c.c. of salt solution. The symptoms usually subside within half an hour.

The reviewer had under his care recently a case of some rarity and interest which ended fatally. The patient was a lady over 60, who suffered for years from a right-sided goitre which produced no symptoms and caused no inconvenience. A near relative died suddenly, and, on receipt of this news, the goitre immediately enlarged. Pressure symptoms arose, following marked lateral displacement of the larynx. The enlargement increased further, until towards the end of three weeks the pressure symptoms became alarming. In addition to dyspnœa, there was marked difficulty in swallowing. Rest, and application of cold, etc., locally, brought about no improvement.

It was after three weeks of these symptoms that the writer first saw the patient. She had then a good colour, and was able to describe her symptoms cheerfully and well. She had some stridor, and the laryngeal cartilages were pushed over to the left. According to her medical attendant, the local changes in the goitre were very marked. From having a movable, small, uncomplicated goitre for many years, there was now a diffuse swelling in the neck, quite immovable, markedly tense, and extending from below the right ear down to the clavicle and across the middle line to become lost behind the sternum. There was no redness, pain, or temperature. Breathing was very difficult, but there was no cyanosis. Swallowing was almost impossible.

The age and condition of the patient, and the diffuse indefinable nature of the tumour, put radical operation out of the question. Acute thyroiditis was thought of; but the gland was not painful to the touch, and other signs of inflammation were absent. Furthermore, the condition had occurred very suddenly, and had gradually increased in intensity during three weeks. The history excluded the possibility of malignant disease, i.e., the sudden onset, the absence of pain in the ear, the excellent colour of the patient, and general condition put this hypothesis out of court. The diagnosis was made of sudden hæmorrhage into a pre-existing cystic goitre. A small incision was made over the most tense portion of the swelling, under local anæsthesia, and a large quantity of changing blood-clot, not recent, welled out with the help of a spoon. As a result of this, no change, either in the pressure symptoms or in the condition of the patient, was brought about; and a few days afterwards she died.

According to Berry, hæmorrhage into a goitre is not very uncommon in patients over 60, and, *when possible*, should be treated by removal of the affected lobe. It is often very difficult to differentiate between inflammation and hæmorrhage in these cases.

Liek[2] believes, and thus supports the workers in the Mayo Clinic, that surgery is better than Röntgen rays in cases of exophthalmic goitre. He contrasts the results of 100 similar cases treated by operation and 100 treated by *x* rays.

Wilson[3] speaks of the unappreciated relative frequency of malignant tumour of the thyroid, and states that in Berne there was one case of malignant tumour of the thyroid in every 93 post-mortems. He thinks that the common impression that malignant tumours of the thyroid are relatively rare is due to error of diagnosis. In the Mayo Clinic, of 97 patients known to have malignant disease, there were 50 whose clinical history before the first operation contained no suggestion of malignancy.

The striking feature of Wilson's paper is the thorough manner in which he proves that malignant tumours of the thyroid are constantly missed. The goitres removed at operation from 97 malignant cases were examined pathologically; yet at the first operation 23 of these were passed by the pathologists without suspicion of malignancy.

It is pointed out that a sudden increase in the rate of growth of a long-standing nodular tumour of the thyroid in a patient more than 35, is strongly indicative of beginning malignancy, and a slow continuous growth may be almost equally indicative of the same condition. This similarity of two classes of cases is important, having regard to the misstatements in various text-books. Metastatic deposits are most frequently in the lungs. The skull, brain, and liver are also frequent sites.

Speese and Brown[4] discuss malignant degeneration of benign tumours of the thyroid gland, and again point out that recent literature on the subject discounts those writers who regard cancer of the thyroid as comparatively rare. They quote Balfour as mentioning seven cases in which malignancy occurred in an enlarged thyroid treated previously by injections of various irritants, and by the application of absorbents. They arrive at the following conclusions: (1) Benign tumours of the thyroid gland preceded the development of malignancy in practically all cases. (2) Cancer is found more frequently associated with colloid and fœtal adenomata, and is relatively uncommon in simple colloid goitre. (3) Thorough exploration of both lobes of the thyroid is indicated to prevent leaving behind a small adenomatous nodule from which malignancy may develop at a later date. (4) When cancer is present clinically and diagnosis easy, operative measures offer but little hope. The majority of cases are discovered in the course of operation or in pathological examination. The greater number of such cases are cured by operation (70 per cent). (5) Early operation in all goitres is indicated to prevent malignant degeneration, which on an average in their cases occurred $12\frac{6}{10}$ years after the appearance of the benign goitre. (6) Toxic symptoms occasionally occur in cancer, and may precede the appearance of the malignant tumour and obscure the diagnosis.

Van Hook[5] thinks that one of the most serious difficulties in the treatment of goitre lies in the determination of the amount of tissue to be removed. In operating he arranges the patient as follows:—

Two cylindrical sandbags are needed, each four inches in diameter and about fifteen inches long. One is placed transversely under the back at the upper scapular level. The other is placed exactly under the occipital protuberance. It is not to be put under the neck. Now, if the head is to be extended upon the neck, it is merely lifted a half-inch, rotated backward about an imaginary point located in the upper cervical region, and then replaced upon the sandbag. If the neck is to be flexed, the process is reversed. The novice will find that his difficulties in making and closing the wound and in manipulating the thyroid are pronouncedly minimized by this simple device. During the early part of the operation the anterior part of the neck is made prominent to facilitate the removal of the mass ; during the latter part it is relaxed so that the muscular layers may be readily brought together.

He finds that nicking of the inner borders of the sternomastoid muscles is an advantage in adding to the room necessary for dealing with the vessels of the gland. He emphasizes also the importance of a wide and long incision.

Charles Mayo,[6] in a very interesting general communication on the subject of the thyroid. states that all cystic goitres are the result of degeneration following failure of the blood-supply of encapsulated adenomata. He has seen children under 10 with typical symptoms of exophthalmic goitre, such as tremor, tachycardia. nervousness, and exophthalmos. Substernal goitre is more common than is supposed. Sometimes its presence is indicated by the veins of the neck extending down over the chest, showing the obstruction of the venous flow. This type of goitre is frequently well encapsulated and can be easily enucleated, especially if the patient co-operates by a little cough. Local anæsthesia is therefore desirable in this class of case. Treatment with the *x* rays and radium has been tried in the clinic. The *x* rays produce so much connective tissue that the gland will require knife section if operation becomes necessary. He thinks the *x* rays are dangerous. in that they might produce a complete destruction of the gland, and one patient came to the clinic with cancer of the skin over the gland caused by local *x*-ray treatment. He emphasizes the point, as do all other authorities, that patients with exophthalmic goitre pass through exacerbations of symptoms. During a crisis, the patient should be treated medically and not surgically.

In operating on a patient with a large goitre a transverse incision should be made through the skin and platysma and in the line of the folds in the skin of the neck. The trachea is then exposed, but should not be dissected too freely, or congestion and temporary loss of voice or hoarseness will follow on the second day. with recovery later. A primary division of the isthmus should be made with a turning out of the lobes from the trachea in large goitres, as recommended by Balfour. Preserving a portion of the posterior capsule and avoiding injury to the recurrent laryngeal nerve is a satisfactory method. In exophthalmic goitre double resection largely avoids repeated operation ; otherwise a small percentage of cases might require a second operation, perhaps at the end of two years, and some might require a third operation. This might be accounted for by the statement referred to previously, that nature has very carefully protected the function of the thyroid gland, that some cells are unborn at birth and are constantly becoming ready for hyperplasia.

*Surgery versus X Rays in Hyperthyroidism.*—Crile[7] discusses this question. He states that in the literature the cure of hyperthyroidism has been credited to each of 239 drugs and other methods of treatment. All agree about the value of physiological rest, and, apart from this, surgery and Röntgen rays alone require consideration. He quotes C. H. Mayo as follows : "With Röntgen-ray treatment, remissions may occur just as remissions occur without treatment or with several other methods of treatment. Our experience has been failure or but temporary benefit. It is possible that the ray treatment may destroy the gland and produce hypothyroidism. It is difficult to regulate the dosage, and its use adds to the difficulties of operation." He concludes : From a study of the evidence offered by those who advocate the Röntgen-ray treatment of hyperthyroidism, and a consideration of our own experience, I am inclined to believe that the surgical treatment of hyperthyroidism combined with physiological rest yields the most favourable results. Heretofore, the only valid objection to surgical treatment has been the mortality; but now surgical treatment is undertaken in every case; the mortality is practically eliminated; much time is saved, and a more certain cure is achieved.

Reverting to the same subject, Crile,[8] makes the following interesting points: *X*-ray treatment does reduce the activity of the thyroid. It is a simple, painless procedure. Then why not use *x* rays to the exclusion of other procedures? Because of the following disadvantages: (*a*) The dose required to produce a given effect is at best a guess; (*b*) Relapses are common; (*c*) The delay in unsuccessful cases leads to serious damage to certain organs—the myocardium, liver, nervous system, etc.; (*d*) In case of operation later, the scar tissue and adhesions caused by the *x* rays are a handicap. The dilemma in the use of the *x* rays is: myxœdema or relapse. If the dose is sufficient to kill all the thyroid cells, myxœdema results; if the dose does not kill the cells, they recover and there is relapse.

*Indications for Ligation.*—In this clinic ligation is employed only as a preliminary to thyroidectomy. Double ligation rarely cures, but as is the case after *x*-ray treatment, there is a tendency to relapse; and when relapse occurs, we have lost the nicest step in the graded operation. *X* rays might be used instead of ligation as a part of a graded operation, excepting for the uncertainty of the extent to which it has destroyed the thyroid tissue.

To what is the good effect of ligation due? Certainly not to the diminution of the blood-supply, for no matter how soon or how late after ligation the thyroidectomy is performed, the local blood-supply is found to be diminished but little. In fact, it often seems as if the blood-supply after ligation is richer because of all the developed collateral branches. I am of the opinion that the greater part of the benefit from ligation is the result of a break in the nerve-supply of the thyroid, since the principal sympathetic nerves run in the walls of the superior thyroid arteries.

*Indications for Thyroidectomy.*—Diagnosis of hyperthyroidism is the indication for thyroidectomy because, if we wait to try out the rest cure, in that case rest may fail to cure, and this is true in too many cases; and when the rest cure fails, the patient has sustained serious additional damage, perhaps permanent damage, to the myocardium, to the liver, to the nervous system; his life has been shortened; the difficulty of the operation has been increased; and much time has been lost.

It is only within recent years that we have been able to put hyperthyroidism in the class with appendicitis as to operability, but now the mortality of thyroidectomy is almost as low as the mortality of appendectomy. In view of the comparatively short stay in hospital, the slight risk, the inconsequential scar, we are prepared to accept the dictum '*Operate on diagnosis*'.

**Colloid Goitre.**—Sistrunk[9] refers to Plummer's statement that there are only three definite types of goitre—colloid, adenomatous, and exophthalmic.

Colloid goitre is definitely a goitre of youth, most frequently occurring between the ages of 15 and 25. It is the type which usually produces the uniform fullness of the neck so often seen in young women.

The writer of this paper very properly emphasizes the difficulty of distinguishing this type of goitre from the exophthalmic type, especially if of the vasomotor variety with thrills and bruits. Quite often these young women have tachycardia and nerve symptoms. The basal metabolic rate is, however, normal or slightly below normal, never increased. This test is absolute in the differential diagnosis.

Colloid goitre is the only type of goitre which disappears under the administration of iodine or thyroxin, and should not be considered a surgical condition. If this fails, the goitre is probably not colloid, but of a mixed type. In this case the colloid portion disappears under treatment, but the adenomata remain.

**Adenomatous Goitre.**—Adenomatous goitre is the most common type, and most often seen in persons of middle age, although it probably occurs in early life. The enlargement of the thyroid is produced by the growth within the substance of the thyroid gland of encapsulated adenomata. Very large goitres are mostly of this type. There is often a sufficient decrease in the secretions of the gland to produce mild hypothyroidism with a lowered basal metabolic rate.

Plummer found that 23 per cent of patients with adenomata of the thyroid suffered from hyperthyroidism, but the symptoms had not developed until the goitre had been present for an average of sixteen years. Adenomata with hyperthyroidism, i.e., Plummer's disease, differs in many respects from exophthalmic goitre, and is a definite clinical entity.

Adenomatous goitres seldom produce toxic symptoms in persons under 30. When toxic symptoms develop, the metabolic rate is found to be increased, although it is not so high as the rate in cases of exophthalmic goitre. The body is differently affected by the long-continued mild hyperthyroidism in this disease, and by the rapidly increasing, severe hyperthyroidism of exophthalmic goitre ; in the former the cardiovascular system suffers more severely, while in exophthalmic goitre the nervous system is more profoundly affected. Often the condition goes unrecognized until symptoms of myocardial degeneration occur and the patient begins to suffer from palpitation, arrhythmia, and —later—dyspnœa and œdema. Unless the myocardial changes are very marked, the condition is almost always associated with *increased blood-pressure*, Other symptoms of hyperthyroidism, such as tremor, flushed moist skin, tachycardia, and loss of weight and strength; are present.

Adenomatous goitres are usually best treated by surgical measures, but small adenomatous goitres in young persons may, with advantage, be left until the age of 25 or 30. There is no danger of toxicity until it has been present on an average for about sixteen years. Furthermore, in young people the thyroid gland is very essential, and in removing an adenomatous goitre much useful gland substance will also be sacrificed. A minute adenoma may be missed at first, and, in order to avoid secondary operations, delay is often an advantage.

Sistrunk thinks that they ought not to be treated surgically until the age of 25 or 30, unless special indications for operation are present. If toxic symptoms have already arisen, operation should not be delayed. Very marked improvement immediately follows such an operation. If myocardial changes are marked, the operative risk is of course increased.

**Exophthalmic Goitre.**—It is perhaps not sufficiently realized that this disease usually comes on suddenly, and within the first six months all the characteristic phenomena are obvious, and the patient is going through what is known as a 'thyroid crisis'. Sometimes these symptoms occur before any enlargement of the thyroid gland has been noticed. After passing through a crisis, the condition of the patient improves considerably, but within the next few years he passes through another similar period. During these periods much damage occurs to the heart and the vital organs, as the result of degenerative changes. The gland is usually symmetrically enlarged and quite hard, and an increased metabolic rate is, of course, present. Surgical treatment is indicated in practically all cases. By medical methods improvement or cure may be brought about; but this, according to American literature, is never certain, and if it fails much valuable time is lost.

Patients, during an acute thyroid crisis, are extremely dangerous surgical risks, and should be regarded as non-surgical cases during that period. When the period is past there is a gain in weight, a drop in pulse-rate, and decrease of nervous symptoms and mental irritability. An operation now is not likely to produce acute hyperthyroidism, but the degenerative changes in the heart muscles, after this crisis, must be appreciated. **Ligation** of the two superior thyroid arteries, under local anæsthesia, with a week's interval, is good practice in doubtful surgical risks. **Thyroidectomy** can be performed several months later. The results obtained following thyroidectomy depend largely on the extent of damage to the vital organs at the time of operation, the best results being obtained in patients operated on early in the course of the disease before severe damage to the vital organs has occurred. If the damage to the organs has been extensive, it is impossible to restore the patient to normal health; the operation usually stops the hyperthyroidism and great improvement follows, but true organic damage cannot be repaired.

Sistrunk sums up as follows:—

1. Plummer divides all goitres into three classes: colloid, adenomatous, and exophthalmic.
2. Colloid goitres occur in young persons, are not surgical, and respond to treatment with iodine and thyroxin.
3. Adenomatous goitres usually appear in young persons. Twenty-three per cent of the patients with adenomatous goitres seen in the Mayo Clinic show symptoms of hyperthyroidism; but these symptoms do not develop until the goitre has been present for an average of about sixteen years. In young persons, unless the goitres attain considerable size or produce symptoms of pressure, they are not considered surgical. In the majority of cases after patients with adenomatous goitre have attained the age of 25 or 30, surgery is advocated. All adenomatous goitres associated with hyperthyroidism are considered surgical if the condition of the patient will permit an operation.
4. Exophthalmic goitres occur at any age, but most often between the ages of 20 and 40. The condition is best treated surgically, and the best results are obtained in patients operated on early in the course of the disease before marked damage has been done to the vital organs. Many patients require one or two ligations of the superior thyroid vessels preliminary to thyroidectomy, in order to make the latter a safer procedure. If care is exercised in selecting the type of operation which should be performed in a given case, the mortality following operation is low.

References.—[1]*Surg. Gynecol. and Obst.* 1921, Oct., 271; [2]Abstr. in *Jour. Amer. Med. Assoc.* 1921, Nov. 26, 176; [3]*Ann. of Surg.* 1921, Aug., 129; [4]*Ibid.* Dec., 684; [5]*Med. Record,* 1921, Dec. 17, 1072; [6]*Ibid.* July 30, 177; [7]*Jour. Amer. Med. Assoc.* 1921, Oct. 2, 1234; [8]*Ann. of Surg.* 1922, Jan., 47; [9]*Surg. Gynecol. and Obst.* 1921, Oct., 348.

## TIC DOULOUREUX. (*See* Neuralgia, Trigeminal.)

## TINEA VERSICOLOR.

*E. Graham Little, M.D., F.R.C.P.*

Sidlick and Corson[1] report a case of this disease affecting the face in an adult white man, a Russian by birth but resident in the United States for eleven years. He had had the eruption for six years, beginning on the trunk and spreading on the neck, face, and forehead, but not the hairy scalp. Characteristic fungus was obtained in scrapings from the face and forehead, as well as from the trunk. The extension of tinea versicolor to the face in white races is exceedingly uncommon. All the patches cleared under 'routine' treatment.

Reference.—[1]*Arch. of Dermatol. and Syph.* 1922, May, 597.

## TONSILS, DISEASES OF.

*A. J. M. Wright, M.B., F.R.C.S.*

While it is generally accepted that the chronic infections in the pharynx and the nasopharynx associated with unhealthy tonsils and adenoids may be responsible for systemic disturbances, the degree to which this is the case still requires much research. Lapage[1] is of the opinion that infection of the nasopharynx serves as one of the most important foci from which a general toxæmia may take place, with a resulting chronic lowered state of health in the subject. Many varieties of organisms may take part in this infection, but the influenza bacillus is probably the most potent factor. This chronic toxæmia may be manifested by an irritable state of the heart, due to the action of the toxins on the nervous mechanism. Other cases may simply show a general anæmia and lowering of health resembling tuberculous infection of the mediastinal glands. The absence of pyrexia, wasting, and night sweats helps to distinguish the former condition from a tuberculous one. Merrall[2] regards the chronic infection of tonsils and adenoids as an important factor in the etiology of rickets. He considers that the infection spreads downwards to the alimentary canal, affecting digestion and assimilation.

**After-results of Operation.**—So much has been claimed by those in favour of, and so much blame has been attached to the result by those opposed to, these operations, that as a natural result a considerable amount of research is being made into the after-results. Coakley and Pratt[3] give their results of the investigation into the after-condition of 926 cases. They find that, where the operation seems necessary, the results are equally good at whatever age the operation is performed, and that acute infections of the upper respiratory tract and middle ear are much less frequent after operation. In cases of rheumatism in which any other source of infection has been eliminated and in which the tonsils are unhealthy, the results, although not uniformly successful, are such as amply to justify the operation. Cardiac and renal cases, if carefully examined and selected before operation, are in the same category. Wrigley and Archer[4] carefully re-examined 200 cases after operation. The results, on the whole, were eminently satisfactory, inflammatory conditions in the middle-ear having improved or healed. Kaiser[5] classified 5000 cases into three groups, depending on whether: (1) The tonsils were enlarged, and clinical evidence of infection was present; (2) The tonsils were enlarged, but with no evidence of infection; (3) The tonsils were not enlarged, but evidence of infection was present. The cases were examined one year after operation. He found most improvement in cases which before operation had shown obstruction and infection; also a considerable improvement in general health in cases which had shown infection but no obvious obstruction. On the other hand, in cases of group (2), in which, although the tonsils were enlarged, evidence of infection was not present, no obvious change in the general health had taken place. Davis[6] found that the most successful results were obtained in cases operated on under ten years of age, and also that the removal of tonsils and adenoids did not seem to diminish the liability to enlargement of the glands of the neck. Sington[7] considered this problem from the point of view of the general practitioner. Fifty-two cases were studied from the standpoint of the number of professional visits which had to be paid to the children over a period before and after operation. He concluded that the operation had very much improved the health of the children: in half the cases no subsequent visits at all were required, although before operation he had to be seeing these children at frequent intervals.

**Operative Complications.**—

*Hæmorrhage.*—Hæmorrhage during, and immediately following, operation is the complication which has attracted most attention. As a result of a discussion at the annual meeting of the British Medical Association,[8] the following general conclusions were arrived at: Severe and uncontrollable hæmorrhage is very rare, and when it does occur is due to the wounding of an abnormal vessel—most frequently the internal carotid, and sometimes the ascending pharyngeal or ascending palatine. These abnormal vessels may sometimes be observed pulsating under the mucous membrane in the lateral wall of the pharynx, and it has been suggested that it is wise to palpate the tonsillar region in all cases before operation. These cases can only be treated by ligating the vessel through an incision in the neck. The frequency with which lesser degrees of hæmorrhage occur undoubtedly depends to some extent upon the technique of operation. Bleeding is most troublesome when the vessels are cleanly divided by a sharp guillotine, is less troublesome when the vessels are partially crushed during division by a blunt guillotine, and probably least troublesome of all in cases in which the vessels are torn through by blunt dissection. The most certain method of preventing post-operative hæmorrhage is to pick up each bleeding point and, if necessary, ligate it during the operation. When this is done, the number of cases of so-called recurrent hæmorrhage requiring treatment after operation is enormously diminished, these cases being really cases of continued hæmorrhage, concealed owing to the fact that the blood is swallowed. To avoid this possibility, it is important after operation to keep the patient lying flat and nearly on his face so that the blood may run out. In cases which are found to be bleeding after operation, a clot will usually be found in the tonsillar fossa on the side which is bleeding, and, if this is removed, the bleeding will often stop without further treatment. If this does not happen, pressure with a swab held in forceps, or the use of one of the varieties of clamps made for the purpose, may be effective. The latter instrument, however, requires to be used with caution, cases of troublesome sloughing having occurred as a result of its employment. If these measures are unsuccessful, ligation of the vessel or the stitching up of the tonsillar fossa should be resorted to, and usually requires an anæsthetic. The answer to the question as to which is the better method depends on the idiosyncrasy of the surgeon.

O'Malley[9] regards acute inflammation as an absolute contra-indication to operation owing to the risk of hæmorrhage, and this opinion is generally accepted. He suggests that cases with abnormal vessels, cases of renal and cardiac disease, and alcoholics, require special precautions. In the case of hæmophilia, operation is contra-indicated. In cases requiring special precaution he advises two doses of **Horse Serum** or **Hæmoplastin** hypodermically at intervals of forty-eight hours, the last dose being given two days before operation. Half an hour before operation 15 min. of **Pituitrin** is given, thus combining the coagulative effect of the serum with the vasoconstrictor effect of the pituitrin. Coagulose (dried serum) can be used as a local application.

*Pulmonary Abscess.*—This is one of the most severe, although infrequent, operative complications. Fisher and Cohen[10] state that it causes more deaths than either hæmorrhage or otitis media, and have found 76 cases reported in the literature of the United States in the last ten years. Alternative views as to the causation of this condition are that the disease is due to the aspiration of infected material during the operation, or that infarction takes place from a thrombosed vein at the site of operation. The former is almost certainly the correct view, in that aspiration only occurs after an operation under a general anæsthetic, that the abscess is single, and that it is situated in the middle or lower lobe of the right lung. Symptoms also develop during the first thirty-six hours after operation. Prevention of this complication therefore lies in the direction of preventing aspiration during operation.

**X-ray and Radium Treatment.**—*X*-ray as an alternative to operative treatment was referred to in the MEDICAL ANNUAL of 1922, p. 472. This treatment has apparently been extended in the United States. Its use is largely confined to cases in which operation for some reason is contra-indicated. The risks are the production of dermatitis, or damage to the thyroid, parathyroid, and other neighbouring structures. Some considerable time must elapse before judgement can be passed on this method.

Withers[11] has employed radium as an alternative to *x* rays. He finds it superior, in that it avoids any of these possible dangers and that its application is simpler and can be more localized.

REFERENCES.—[1]*Brit. Med. Jour.* 1921, ii, 4; [2]*Lancet,* 1921, ii, 994; [3]*Laryngoscope,* 1922, Feb., 81; [4]*Jour. Laryngol. and Otol.* 1922, March, 122; [5]*Jour. Amer. Med. Assoc.* 1922, June 17, 1869; [6]*Ibid.* April 22, 1187; [7]*Brit. Med. Jour.* 1922, i, 341; [8]*Ibid.* 1921, ii, 431; [9]*Ibid.*; [10]*Jour. Amer. Med. Assoc.* 1922, Oct. 22, 1313; [11]*Laryngoscope,* 1922, March, 163.

## TRACHEOTOMY (*See* DIPHTHERIA.)

## TRACHOMA. (*See* EYE, GENERAL THERAPEUTICS OF.)

## TRICHOPHYTON PURPUREUM. (*See* RINGWORM.)

## TROPICAL ULCER (Tropical Sloughing Phagedæna).

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

A. G. Apostolides[1] gives a good description of this sloughing tropical form of ulceration as seen in Palestine, and agrees with others that the commonest organisms discovered are Vincent's fusiform bacillus and a spirochæte, apparently in symbiosis, as is also found in gangrenous stomatitis. The cases occurred mainly in jungle lands. The disease is inoculable, although with some difficulty, owing to the fusiform bacilli being often absent from the superficial discharges but present in the deeper tissues. In 89 per cent it occurred in closely associated groups of men or children, 5 per cent having slept under the same canvas; but children under five years are rarely attacked, and most cases are seen at the end of the rains. In hospitals, patients suffering from other wounds, occupying beds next cases of tropical ulcer, contract it in the majority of cases. Insects have been suspected of carrying the infection, the most likely one in Palestine being the mosquito, 97 per cent of those living in a mosquito-infected camp suffering, as compared with only 2 per cent of Egyptians working with them but leaving at 6 p.m. for their insanitary, but not mosquito-ridden, villages; at the camp the foul dressings had been thrown away near by and swarmed with flies and mosquitoes. The incubation period in some definite cases was only two or three days, and in 85 per cent the ulcers were on the legs and feet, being single in 90 per cent of the cases. The deeper structures are rarely involved. The Wassermann reaction was positive in 61·8 per cent in one reported series.

TREATMENT.—**Incision, Scraping,** and sterilization with **Iodine** or 0·5 per cent **Hypochlorous Acid** arrest, but do not cure, and **Radiant Heat** is useful; but the best results were got by 0·45 to 0·60 grm. **Neosalvarsan** intravenously. F. S. Lister and H. Q. F. Thompson[2] in South Africa found the fusiform bacillus most frequently, but the spirilla were rare. They used **Excision, Curetting,** and **Novarsenobillon** locally in six cases each, and found the last at least equally effective.

REFERENCES.—[1]*Jour. Trop. Med. and Hygiene,* 1922, 81; [2]*Public. S. African Inst. for Med. Research,* 1921, Sept., No. xii.

## TRYPANOSOMIASIS. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Treatment.—The new trypanocidal drug known as '**Bayer 205**', the composition of which has not yet been made public by the German manufacturers, is reported on by P. Muhlens and W. Menk,[1] who record the successful use of this preparation in an advanced case of *T. rhodesiense* infection in a patient sent to Hamburg after the failure of the tartar emetic and other treatment in Liverpool. C. Wenyon[2] also records experiments on trypanosome-infected mice with this drug, which he finds is capable of completely sterilizing their blood in a single dose far below the minimal lethal dose, in a manner that he never obtained with any other preparation, so it is clearly very promising in trypanosomiasis and also in kala-azar.

C. H. Marshall[3] records further promising results in sleeping sickness in Nigeria from the intraspinal injection of single doses of **Salvarsanized Serum**, obtained by drawing off blood from a patient three hours after an intravenous injection of neokharsivan, and subsequently using the serum which separates, in 20-min. doses intrathecally; in one case serum from a trypanosomiasis patient without the preliminary arsenical injection appeared to be effective. He thinks the blood of trypanosomiasis patients develops some trypanolytic antibody as a reaction to the invasion of the parasite; but it is unable to reach the parasites in the cerebrospinal fluid unless the serum is injected into the subarachnoid space. Of 52 cases so treated, only 6 died; the rest were well some months later, while the enlargement of their glands had completely subsided. This method has not yet proved successful in the hands of other observers,[4] and further reports at longer periods of time after the treatment will be awaited with interest. In a further paper by J. W. H. Eyre and C. H. Marshall,[5] criticisms of the above method are replied to. A European patient who had recovered his health perfectly after the treatment was shown by Marshall at the Royal Society of Tropical Medicine; his cerebrospinal fluid had been found by Eyre to be uninfective to susceptible animals, although six months after the injection it was still infective.

C. L. Trout[6] is using the Swift-Ellis method of injecting **Autoserum** intraspinally after giving doses of **Galyl, Urotropine**, and **Tartar Emetic** respectively intravenously. He obtained the serum either by taking blood from the patient's veins about six hours after the injection of the drugs, or by raising a large blister on the skin and withdrawing the serum from it with a syringe. He thinks decided improvement, especially after using tartar emetic, has resulted in a few cases, although sufficient time had not elapsed to judge of the ultimate results in the advanced cases they have been dealing with.

S. Adler[7] reports experimental trials of **Phenylglycin-amido-arsenate of Sodium** on *T. brucei* in rats and on *T. rhodesiense* in mice. In the latter it failed to show any curative effects, but in the rats the minimal lethal dose was 1·2 grm. per kilo, and doses of 0·7 grm. per kilo and upwards produced disappearance of the trypanosomes from the peripheral blood, with no relapses after seven months. The same worker[8] found bismuth sodium tartrate useless against trypanosomes. G. C. Low and H. B. G. Newham[9] report a case of trypanosomiasis acquired in Portuguese East Africa, which was apparently cured in Africa, and showed no definite signs of the disease on coming to England, the main treatment having been 363 gr. of **Tartar Emetic**, together with several arsenical preparations.

References.—[1]*Münch. med. Woch.* 1921, Nov. 18, 1488, and *Ann. Trop. Med. and Parasitol.* 1921, Dec. 30, 479; [2]*Brit. Med. Jour.* 1921, ii, 746; [3]*Jour. Trop. Med. and Hygiene*, 1921, 265; [4]*Lancet*, 1921, ii, 573; [5]*Brit. Med. Jour.* 1921, ii, 284; [6]*Jour. Trop. Med. and Hygiene* 1921, 321; [7]*Ann. Trop. Med. and Parasitol.* 1921, Dec. 30, 427; [8]*Ibid.* 437; [9]*Brit. Med. Jour.* 1922, i, 96.

## TUBAL GESTATION. (*See* Pregnancy, Disorders of.)

## TUBERCULOSIS, PULMONARY.

*Arthur Latham, M.D., F.R.C.P.*
*J. A. Torrens, M.D., F.R.C.P.*

*Development of Pulmonary Tuberculosis after Influenzal or other forms of Pneumonia.*—Dickinson[1] confirms Fishberg's dictum that tuberculosis is not engendered by influenza or pneumonia, a point of view that has been vigorously attacked in the United States of America. Dickinson followed up 394 cases of pneumonia, influenzal or other, and found that in only 6 had tuberculosis subsequently developed. Nevertheless, no fewer than 42 out of 274 new sputum-positive cases of pulmonary tuberculosis gave a history of their illness starting with influenza. The explanation would appear to be that pulmonary tuberculosis frequently begins acutely with symptoms resembling influenza.

*Growth of Tuberculous Children.*—Rahbek[2] has studied the weights and heights of 500 tuberculous children at Kolding. He found that the average height in these children was 1·4 per cent above the normal for boys and 1·9 per cent, for girls on admission; and respectively 2·2 per cent and 2·6 per cent above the normal on discharge. It has been suggested that tuberculosis promotes the growth by stimulating the functions of the thyroid gland, but it seems far more probable that tuberculosis tends to attack those children who are overgrown. In favour of the latter alternative Rahbek points out that those children whose tuberculosis commenced during the period of most rapid growth were taller than the rest; also that girls show a much higher tuberculous morbidity than boys between the ages of 7 and 14 years, at which time they are acquiring 33·6 per cent of their total height, as against 28·6 per cent for boys during the same period.

Diagnosis.—

*Complement-fixation Test.*—This test is discussed by Crocket,[3] who finds that the reaction is positive in 92 per cent of cases, but that 10 per cent of apparently healthy individuals react.

Munro-Smith,[4] in an exhaustive review of this test, concludes as follows: (1) In a clinically suspicious case, where the Wassermann is negative, a positive complement-fixation reaction is strong presumptive evidence of tuberculosis. (2) In a clinically tuberculous patient a positive reaction denotes activity of the lesion. (3) *Repeated* negative reactions may be taken to indicate either the absence of tuberculosis, or that a lesion previously active has become inactive; a *single* negative is of little or no value in a clinically suspicious case. (4) The reaction may be negative in far-advanced cases dying of the disease. (5) A positive reaction is most likely to be found in patients where the presence of tubercle bacilli in the sputum, or the clinical signs and symptoms, render the test unnecessary for diagnosis. (6) Non-specific fixations may occur, notably where the serum gives a positive Wassermann reaction. (7) The intensity of the reaction seems to bear no relation to the patient's power of resistance or to the degree of severity of the infection.

Punch and Gosse[5] find the reaction gives positive results in 98 per cent of cases, while in 140 controls only 3 positive were recorded.

Treatment.—

*Calcium in Treatment of Pulmonary Tuberculosis.*—Maendl[6] presents his second report on the benefit from intravenous injection of **Calcium** in pulmonary tuberculosis, which he has been applying for four years at the Alland Sanatorium. With severe hæmoptysis, he gives 5 c.c. of a 10 per cent solution of calcium chloride every eight hours until there is no further hæmorrhage, and continues it once a day for several days thereafter. A hot arm bath before the injection aids in finding the vein, also the repeated opening and shutting of the fist after the constricting band is applied. He has given systematic courses of intravenous injections of the calcium chloride to 250 patients, a total of 4000 injections. They are made every day or second day, to a total of twenty, and then suspended for a week or two and resumed again. He ascribes to this treatment the subsidence of the subfebrile temperature in a number of rebellious cases, and says that the effect on the cough, expectoration, night sweats, and shortness of breath was decidedly favourable. This drug induces local necrosis when injected subcutaneously or into a muscle, but he has had no necrosis with the intravenous technique of late years. The injection never induced fever. He compares his experience with the conflicting testimony of others in regard to calcium chloride by the vein in various diseases.

Calcium treatment is also favourably reported on by Prest,[7] Tweddell[8], and others.

*Hæmoptysis.*—Tideström[9] excludes one limb from the circulation, removing the constricting band very slowly ; he also gives **Gelatin** internally, 3 to 4 oz. of a 1 per cent solution daily.

Ehrenburg[10] deprecates the use of a narcotic, but ties a long stocking round each limb so as to produce venous engorgement ; these bands are left for thirty minutes after the main hæmoptysis has ceased. If the hæmorrhage is very profuse, he also injects 7 c.c. of a 10 per cent solution of **Calcium Chloride** into a vein, and gives **Sodium Bromide** by the mouth.

Boekhoudt,[11] arguing from his own case, considers that hæmoptysis is the result of stasis in the bronchial veins, one of his reasons being that the hæmorrhage often stops abruptly when the effused blood has been coughed up and the stasis relieved. He considers, therefore, that free breathing should be encouraged and sedatives discouraged.

Schwatt[12] reviews most of the known forms of treatment for hæmoptysis, and concludes that all are valueless with the possible exception of **Emetine Hydrochloride** in doses of 1½ to 3 gr., under the skin, which seems to do good in certain cases, and **Artificial Pneumothorax**, which is a certain cure if it can be induced.

There is an undoubted tendency to insist less on the importance of absolute immobility and repeated narcotic injections in the treatment of hæmoptysis ; it is established that the hæmorrhage is nearly always self-limiting, whatever treatment be adopted, and the great number of remedies that have been advocated from time to time, only to be discarded after a thorough trial, seems to show that no drug is of proved value, while any hæmorrhage so severe as to prove fatal will almost certainly not be amenable to any form of treatment at our command, with the sole exception of pneumothorax.

*Pyrexia.*—Gerty and Cori[13] report favourably on a modification of Berliner's **Camphor-Menthol-Eucalyptus Injections.** Only two out of 50 patients in Turban's second stage of the disease did not yield to this treatment, while 51·8 per cent of 85 patients in the third stage were similarly relieved. Two or three intramuscular injections are given weekly into the buttock. Each injection consists of : Pure iodine 0·1 grm. ; camphor 0·5 grm. ; menthol 10 grm. ; eucalyptus oil 10 grm. ; castor oil 20 grm.

*Diarrhœa and Vomiting.*—Many authors claim excellent results in both conditions from the intravenous injection of **Calcium Chloride.** Rist, Ameuille, and Ravina[14] inject from 2 to 4 c.c. of a 5 per cent solution. Ringer and Minor[15] use 5 to 10 c.c. of a 5 per cent solution. Efremides[16] claims a cure in 50 per cent of his cases and definite improvement in the remainder.

Lassablière[17] treats all forms of diarrhœa in the phthisical, which are not due to actual ulceration, with a **Diet** consisting only of sweetened condensed milk diluted four times with rice-water, two litres being taken in the twenty-four hours.

**Vaccine Therapy.**—Hollaender[18] explains the ten links in the chain that is formed by immune-pathology and immune-therapy. Phagocytosis is the indispensable first link. Treatment must aim to imitate and follow the natural processes of auto-immunization. His conception of this is that the tubercle bacilli ensconced in the body or injected in a vaccine are incorporated by the phagocytes. The phagocytes produce agglutinin; this dissolves the waxy shell of the bacillus, and releases the bacillus protein, the endotoxin. The fourth link in the chain is the ectodermotropic properties of the endotoxin, which ensure that it becomes anchored in the cells of the ectoderm. These cells produce lysins under the influence of the endotoxin, which is the fifth link in the chain, as these lysins have a proteolytic action. This transforms the endotoxin into the soluble exotoxin (albumoses, peptone, nucleo-albumoses). The exotoxin is mesenchymatropic, and this anchors it to the body cells derived from the mesenchyma. These latter cells produce, under the influence of the exotoxin, a precipitin. This precipitin causes the disintegration of the exotoxin, breaking it up into its elements, polypeptids, aminoacids, and purin bases, some of which are insoluble. The combination of them all forms the anaphylatoxin, the ninth link. The anaphylatoxin is not retained, but is eliminated, this tenth link completing the chain. Systematic subcutaneous injections of the vaccine start and maintain the chain at work.

**Artificial Pneumothorax.**—Barlow and Kramer[19] advocate partial unilateral or bilateral pneumothorax as being preferable to the more usual unilateral complete compression. They claim that the lesser tension on adhesions is of great advantage, and also that pleural effusions do not develop as they do in 30 to 40 per cent of cases treated by the modern high-pressure method. More evidence is required before this claim can be held to be substantiated.

Neuer[20] points out, from an analysis of 91 cases, that promising cases sometimes do badly, while apparently hopeless ones often do surprisingly well and make a complete recovery. This suggests that our standards as to what is a suitable case may require revision, and that it is probably entirely unnecessary to reserve this treatment strictly for cases of unilateral disease. The character of the disease and the patient's reaction to it are probably of more importance than its extent and distribution.

Stivelman and Rosenblatt[21] review the management of pleural effusions in the course of therapeutic pneumothorax, and conclude as follows: (1) The immediate effects of serous effusions occurring during pneumothorax treatment are usually beneficial, but ultimately they cause premature re-expansion of the lung and obliteration of the pleural cavity; it is therefore unwise to discontinue the treatment and adhere to the dictum of 'leave effusions alone'. (2) Small transitory effusions which do not alter the intrapleural pressure require no special attention. (3) Moderate effusions which do not displace the mediastinum and do not interfere with the continuation of the pneumothorax need not be aspirated, but the pneumothorax should be continued with increasing intrapleural pressure to prevent obliteration of the pleural cavity. (4) Large effusions should always be aspirated and replaced by air, and the pressure regulated according to the needs of the individual case. (5) Purulent effusions should always be aspirated and replaced by air, not only because of their toxicity, but also on account of their tendency to produce extensive adhesion formation and obliteration of the pleura.

In discussing the clinical significance of altered intrathoracic equilibrium in pneumothorax, with special reference to optimum pressures, Stivelman, Hennell, and Golembe[22] consider that with a flexible mediastinum high pressures should at all times be avoided. Their guiding principles, they state, are: (1) To avoid sudden change in the intrathoracic equilibrium and in the relative position of the intrathoracic viscera. (2) To avoid high pressures in the presence of a flexible mediastinum. (3) Gradually but definitely to increase the positive intrapleural pressure in cases in which pleural obliteration is threatening. (4) To individualize the cases, determining the optimal pressure requirement of each.

Saxtorph[23] reviews the late results of pneumothorax treatment in 200 patients among the working classes. They were classified according as: (1) A pneumothorax could not be induced, 58 cases; (2) Only a partial pneumothorax could be induced, 34 cases; and (3) A complete pneumothorax could be induced, 108 cases. Two years or more after the discharge of these patients it was found that of the 58 in the first class, 47 were dead, 6 were alive but unwell, and only 5 were fit for work. Of the 34 patients in the second class, only 18 survived, and of these only 3 were fit for work. But of the 108 patients in the third class, in which the pneumothorax was comparatively large and unlimited by other than slight apical adhesions, 34 were alive, and for the most part fit for work, two to six years after discharge. It appears from these figures that a working-class patient in the third stage of pulmonary tuberculosis may have a 33 per cent chance of recovery maintained for several years if his artificial pneumothorax is big enough.

*The Ultimate Outcome of* **Sanatorium Treatment.**—Burnand[24] prints the questionnaire he has been sending to 1340 former patients treated at the Leysin Sanatorium, and leaving between the years 1912 and 1917. The questionnaire was filled out and returned by 644 families. Of the 331 known to be living, 286 have full earning capacity restored; 32 are able to do only light or intermittent work, and 13 do not support themselves. Of the 174 supposedly cured when they left the sanatorium, 85·05 per cent have full earning capacity. Of the 438 listed as cured or materially improved, 63·24 per cent still have full capacity from four to eight years later. Of the 313 who have died since, 217 were in the third stage, 78 in the second, and only 18 were in the first stage. On the other hand, 164 of the 318 with restored earning capacity were in the second and third stages of the disease. He regards these figures as encouraging, saying that advanced cases do not belong to a people's sanatorium, the aim of which is to restore the full earning capacity. He emphasizes further that even a six months' stay is too short.

**Surgical Treatment.**—Sauerbruch[25] extols the fine results that can be realized by extensive resection of ribs to mobilize the wall of the chest in cases of chronic unilateral tuberculosis, with cavities, in which conditions prevent artificial pneumothorax. Improvement follows in a large proportion of the cases, and it amounts to a permanent cure in a third of them. A combination of resection of ribs, above or below, plus an artificial pneumothorax over the rest, is often effectual. Jacobæus advocates severing the adhesions with the galvanic cautery under direct thoracoscopy, but Sauerbruch prefers to this the combination of rib resection and artificial pneumothorax as answering the same purpose with less danger. The adhesions may contain vessels and bronchial twigs, and hæmorrhage might be entailed by severing them. Extrapleural tamponing may aid, the lung gradually shrivelling and retracting away from the tampon. He does not approve of the use of a filling. He regards direct opening up of a cavity with rigid walls as justified, and advises not to reserve it for the last resource. He has operated on the lung in 481 cases, and 40 per cent were benefited. They were all rebellious to years of climatic-dietetic treatment. The most brilliant successes, he adds, were in persons who continued or resumed their self-support.

Stöcklin[26] describes 13 cases and two years of experience with loosening up the lung from the chest wall and implanting a **Paraffin Filling.** It is applicable only when the process is predominantly unilateral, with tendency to cavity production. Baer resected a rib, but the author merely divides one or two ribs from their cartilages. With this they can be prised up enough to allow the pneumolysis with the finger. Nerve blocking plus sedatives answered for the anæsthesia. The extrapleural cavity is then packed with discs of paraffin about the size of a five-franc piece, of different thicknesses, fitting them in by pressing them against the ribs. The total amount was 600 to 1000 c.c. or less. The paraffin, with a melting-point of 50° or 52° C., was mixed when soft with 0·5 to 1 per thousand of vioform and 0·5 to 1 per cent of bismuth carbonate. The cases were all those in which pneumothorax was indicated but had been impracticable. Access from the rear is preferable when the superior lobe is involved. This filling method has the advantage over thoracoplasty that the functioning of the rest of the lung is not interfered with, and no deformity is left. But thoracoplasty is preferable when the entire lung is to be compressed. The pleura usually reacts with an effusion, and the case has to be watched to detect in time the bulging from the accumulating fluid, and to release it. In the 11 surviving patients, there are no signs of infection of the filling, and the cavity did not break through in any instance. In one case the filling had been applied as a last resort to cure recurring hæmoptysis: the operation proceeded without mishap, but signs of aspiration pneumonia had been discovered in the other lung just before the operation, and the man (age 57) succumbed to this. Necropsy revealed that the filling had been successful.

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## TUBERCULOSIS, RENAL. (*See* Kidney, Surgery of.)

## TUBERCULOSIS OF SKIN. (*See* Skin, Tuberculosis of.)

## TUBERCULOSIS, SURGICAL. (*See* Bones and Joints, Surgery of.)

## TUBERCULOSIS OF URETHRA AND PENIS. (*See* Urethra, Diseases of.)

## TUBERCULOUS LARYNGITIS. (*See* Larynx, Diseases of.)

## TUMOURS. (*See* Cancer; New Growths; Adenomyoma; Myoma; Nævi; Etc.)

## TYPHOID FEVER. (*See also* Paratyphoid Fever.) *J. D. Rolleston, M.D.*

Etiology.—R. G. Perkins[1] reports an epidemic of typhoid fever due to a salad-dressing infected by a typhoid carrier. Of 200 women who attended a lunch at which this dressing was used, 41 (nearly 20 per cent) contracted the disease. A remarkable fact was that the majority of the cases were at the extremes of the incubation period rather than at the mean, 11 cases occurring between the sixth and ninth days, five a day on the eighteenth, nineteenth, and twentieth days, and one on the twenty-first. The early group would seem to indicate a massive infection.

The frequency and gravity of typhoid fever due to the consumption of oysters are emphasized by Courtois-Suffit and Bourgeois,[2] who state that of 118 cases of typhoid fever admitted to their hospital in Paris between July 1, 1919, and January 1, 1921, 35 were due to this cause. Of these, 6 (17 per cent) were fatal, and 25 (71 per cent) had complications, whereas of 81 typhoid fever cases not due to this cause, only 1 died and 8 had complications.

Bacteriology.—N. Svartz[3] made blood cultures in 40 cases of typhoid fever, 10 to 15 c.c. of blood aspirated from a vein being mixed with ox bile and kept in a thermostat for twenty-four hours before cultures were made on agar. Positive results were obtained in all the 12 cases examined in the first week, in 16 of the 22 examined in the second week, in 4 of the 5 in the third week, and in 1 of the 2 in the fourth week. Positive results were thus obtained in 83 per cent, and would probably have been still higher had the test been repeated in negative cases.

Epidemiology.—The tenth annual report[4] on typhoid in the large cities of the United States shows that 1921 was, relatively speaking, a 'typhoid year' in comparison with the decline noted in recent years (*see* Medical Annual, 1920, p. 367; 1921, p. 485; 1922, p. 482). Not only did the majority of the cities experience an increase, although generally slight, over the typhoid-rate of the previous year, but there were only 5 with a death-rate under 2 per 100,000 population, as against 10 in 1920 and 8 in 1919. Cities with a rate over 10 per 100,000 increased from 5 in 1920 to 11 in 1921. The actual increase, however, for the whole group of 69 cities, the population of which amounted to a total of 28,291,435, was not a matter for serious concern. The 1921 typhoid-rate for all these large cities combined was the lowest on record except in 1920, and was less than half the rate for 1916. It is suggested that the abnormally hot summer was in large part responsible for the higher typhoid rates in certain localities, either indirectly by increasing the amount of bathing in polluted waters, or by directly increasing human susceptibility to typhoid infection.

Symptoms and Complications.—A. Rodet and S. Bonnamour[5] maintain that *secondary infection* with non-specific organisms, such as the staphylococcus, streptococcus, enterococcus, tetragenes, or anaerobic germs, is much more frequent in typhoid fever than is usually supposed, and that their presence accounts for the abnormal course of several forms of typhoid fever and for the failure of specific treatment. In 36 cases examined by the writers, other organisms than the typhoid bacillus were found in 15 (41·7 per cent), either alone or in association with it. The association of the enterococcus or streptococcus is particularly formidable, whereas secondary infection with the staphylococcus or tetragenes is less serious, although these organisms may give rise to various complications and be responsible for prolongation of the disease. Lastly, there appears to be a certain relation between secondary infections in typhoid fever and the presence of ulceration in the large intestine.

A. Léri and P. N. Deschamps[6] report a case of *perforation of Meckel's diverticulum* in typhoid fever, of which they have found only four other examples on record. Their patient was a woman, age 22, admitted to hospital with severe typhoid fever. Death took place without any symptoms of perforation, but the autopsy showed perforation of Meckel's diverticulum which had given rise to peritonitis.

H. Dufour and A. Ravina[7] remark that though the *relationship between typhoid and gall-stones* is well established, the presence of calculi in the gall-bladder at the end of an attack of typhoid is generally regarded as a mere coincidence without any causal connection between the two processes. In a recent case observed by them in a woman, age 30, in whom death was due to empyema on the thirty-second day of disease, the gall-bladder was found to contain ten calculi, the largest being of the size of a pea. The writers, following the method of Mignot, Gilbert, and Fournier, who had found typhoid bacilli in the centre of a gall-stone, obtained a pure culture of the bacilli from the cholesterin core of the largest of these calculi. They had also seen a case of typhoid in which, during an operation for cholecystitis, the gall-bladder was found to be filled with gritty particles. It is thus evident that cholelithiasis may occur at an early stage of typhoid fever, and that the calculi may rapidly assume a considerable size.

As is well known, the *pulse-rate* in typhoid fever does not usually exceed 80 to 90 at the height of the disease. In some cases the bradycardia becomes more marked and the pulse is only 50 or even less. The bradycardia may be regular or irregular. Phlebograms taken by Lutembacher[8] showed that there was not merely a simple sinus bradycardia but a disturbance of conduction in the bundle of His. This disturbance of conduction usually occurs at the height of the disease, but sometimes is delayed until the temperature has become normal. Lutembacher's observations show that the typhoid toxins may affect the myocardium, and especially the bundle of His, which, as in diphtheria, constitutes a sensitive reagent to impregnation by the toxins. Their action is often only transient, but sometimes they occasion degeneration of the bundle of His. Lutembacher suggests that some obscure arrhythmias are possibly of typhoid origin.

Many writers have tried to find a guide to prognosis in the changes of the *blood-pressure* in typhoid fever. Thus Teissier in 1900 maintained that a transient rise of blood-pressure often preceded the appearance of hæmorrhage or perforation, and similar conclusions were subsequently reached by Olmer and Voisin, Crile, Crook and Briggs, and Janeway. The reviewer,[9] however, in a paper based on the study of 58 cases of typhoid fever, showed that the study of the blood-pressure in typhoid, as in other acute diseases, does not afford much guidance as to the diagnosis, prognosis, or treatment of the infection. The same view is held by Rebattu and Milhaud,[10] who from their observations on the blood-pressure in 162 cases of typhoid have come to the conclusion that the study of the blood-pressure does not enable one to foretell the onset of hæmorrhage or perforation, the changes in the blood-pressure preceding these complications consisting in a slight fall as often as in a rise of tension.

According to A. Dumas and Paupert-Ravault,[11] who record five cases, the following three varieties of *pleurisy* may be encountered in the course of typhoid fever: (1) Pleurisy due to typhoid or paratyphoid bacilli, of early or late onset, and serofibrinous, hæmorrhagic, or purulent in character; (2) Tuberculous pleurisy, usually occurring late in convalescence; (3) Pleurisy accompanying the bronchopulmonary manifestations which are so frequent in typhoid, whether they are due to the typhoid bacillus or an associated infection. In the present series one was a case of pure typhoid pleurisy, two were examples of pleurisy accompanying bronchopneumonia, and two were probably of rheumatic origin.

Dumas and Bernheim[12] report a case of *hemiplegia*, the rarest form of typhoid paralysis. The patient was a woman of 46, free from syphilis or cardiorenal disease, who developed this complication on the fourth day of disease. The case was remarkable not only for the early onset of the hemiplegia, but also for its transient character, as at the end of a month it had almost completely disappeared. Its most probable explanation was a focus of encephalitis secondary to embolism or to typhoid intoxication of the cortical cells. Cerebral softening due to thrombosis of the Sylvian artery could be excluded owing to the transient character of the paralysis.

P. E. Weil[13] maintains that, of the different varieties of enteric fever, typhoid is almost exclusively responsible for *osteo-arthropathies*. Of 18 cases observed by him, only 2 were due to *B. paratyphosus B* and none to *B. paratyphosus A*. The complication is most likely to occur in prolonged and severe attacks of typhoid fever, and consequently in persons who have not been inoculated. In adults the ribs and costal cartilages are almost exclusively affected, and only rarely the vertebral column and the long bones, while in the adolescent the long bones are chiefly involved, especially the epiphyses at the elbow in the upper limb, and the trochanters and malleoli in the lower extremity.

F. Bazán[14] records a case of a mild attack of typhoid in a girl, age 5, compliplicated by torticollis due to *myositis* of the trapezius, which ended in sclerosis. The child was predisposed to this complication by inherited syphilis and by an attack of torticollis a year previously.

According to W. Steiger,[15] who records an illustrative case, more than a hundred cases of *typhoid strumitis* or infection of a goitre with typhoid bacilli have been reported. The complication may occur years after complete recovery from typhoid, as in Galli's case, in which typhoid bacilli were found in a thyroid abscess twenty-one years after an attack of typhoid fever. Steiger's patient was a woman of 53, who had had a goitre since the age of 40. A few weeks after a febrile attack which was diagnosed as influenza and pleurisy she developed suppuration in her goitre, and a pure culture of typhoid bacilli was obtained from the pus. Recovery followed opening of the abscess and drainage. The practical importance of such cases is that in every case of strumitis or thyroid fistula the possibility of typhoid infection should be considered even when there is no history of the disease.

Tamalet[16] reports two cases of *purpura* occurring at the end of an attack of typhoid. In the first, which developed in a boy of 9, one day after the temperature had become normal, extensive purpura of the limbs was associated with hæmatemesis and intestinal hæmorrhage, death being due to anæmia. In the second case, which occurred in a man of 30 during the third week of typhoid, the purpura was confined to the limbs, and recovery took place.

S. Ekvall,[17] who records a personal case in a girl, age 18, has collected eighteen cases of *infection with gas-forming bacilli* in the course of typhoid fever. In some cases the infection has been traced to the subcutaneous injection of stimulants (*see* MEDICAL ANNUAL, 1922, p. 484). But in no case were the bacilli found in the stimulants used, and as the infection occurred during the stage of intestinal ulceration the source of infection was probably the intestines. In most cases the infection has been localized in the abdomen, giving rise to diffuse or circumscribed peritonitis. In Ekvall's case the localization of a metastasis in the thigh was probably caused by the fact that the patient consistently lay on her right side and thus lowered the vitality of the structures on the outer aspect of the thigh.

PROPHYLACTIC INOCULATION.—H. Vincent[18] advocates inoculation of the civilian population under the following circumstances: (1) In districts where typhoid fever is endemic or epidemic; (2) In families in which one or more persons are suffering from the disease; (3) When the existence of carriers among healthy persons has been proved. In all such cases inoculation should be performed without delay, or it may be too late. But even in the incubation stage it may serve to attenuate the disease or prevent it altogether, if it is performed during the early part of this stage. (*See also* Medical Annual 1919, p, 453.)

According to H. Bourges,[19] who records an illustrative case, pulmonary tuberculosis is a formal contra-indication to antityphoid inoculation, owing to the numerous cases in which dormant tuberculosis had been roused into activity after this operation.

Treatment.—K. D. Fairley[20] treated 8 cases of typhoid fever with intravenous injection of typhoid **Vaccine** concurrently with 7 who served as controls. Two different vaccines were used, viz., a monovalent vaccine of *B. typhosus* and a stock T.A.B. vaccine. In both vaccines the organisms had been killed by heat (60° C. for an hour), and 0·5 per cent phenol was then added in 0·85 saline solution. The doses varied between 75 million and 300 million typhoid bacilli. Large initial doses were inadvisable owing to the severity of the pyrexial reaction caused thereby. In one half the treated cases the attack was aborted by crisis, while in the other half the temperature was apparently not affected, but in all the cases treated by vaccine there was a marked improvement in the general condition or a complete disappearance of the toxæmic symptoms. All the cases treated by vaccine recovered, and one of the control series died. H. Dufour and J. Thiers[21] recommend the use of T.A.B. vaccine in typhoid and paratyphoid osteoperiostitis.

Surgical Treatment of Carriers.—E. Murstad[22] analyses the results of operation on the gall-bladder in 24 typhoid carriers. In 4 out of 8 cases in which **Cholecystostomy** was performed the carrier ceased to carry, and the same result was achieved in 15 out of the 16 cases in which **Cholecystectomy** was performed. Murstad recommends the latter operation in the interest both of the carrier and of the community. He deprecates vaccines or drug treatment when typhoid bacilli are found in the stools, but states that carriers who excrete typhoid bacilli only in the urine are not infrequently sterilized by drugs, the most effective of which are the formaldehyde group.

References.—[1]*Jour. Amer. Med. Assoc.* 1922, i, 1184; [2]*Bull. de l'Acad. de Méd.* 1921, i, 239; [3]*Med. Science,* 1922, vi, 322; [4]*Jour. Amer. Med. Assoc.* 1922, i, 890; [5]*Presse méd.* 1921, 1009; [6]*Bull. Soc. méd. Hôp. de Paris,* 1921, 1554; [7]*Ibid.* 1530; [8]*Presse méd.* 1921, 766; [9]*Med. Press and Circ.* 1916, i, 234; [10]*Lyon méd.* 1922, 58; [11]*Ibid.* 332; [12]*Ibid.* 54; [13]*Bull. Soc. méd. Hôp. de Paris,* 1921, 449; [14]*Med. Science,* 1922, v, 294; [15]*Wien. med. Woch.* 1922, 601; [16]*Jour. de Méd. de Bordeaux,* 1921, 511; [17]*Med. Review,* 1922, 177; [18]*Bull. de l'Acad. de Méd.* 1921, i, 123; [19]*Bull. Soc. méd. Hôp. de Paris,* 1921, 283; [20]*Med. Jour. of Australia,* 1921, ii, 428; [21]*Lancet,* 1922, i, 747; [22]*Med. Science,* 1922, vi, 322.

## TYPHUS FEVER.

*J. D. Rolleston, M.D.*

Bacteriology.—L. Loewe, S. Ritter, and G. Baehr[1] isolated from the blood of typhus patients minute bodies which morphologically and tinctorially were similar to *Rickettsia prowazcki.* These bodies were subsequently cultivated from the blood, brain, and kidneys of guinea-pigs which had been infected with typhus by inoculation of blood from typhus patients, or by intraperitoneal inoculation of a typhus virus originally obtained in Poland and kept alive by numerous successive passages through animals. The culture medium consisted of 10 c.c. ascitic fluid and 0·5 c.c. of 20 per cent dextrose or 2 per cent dextrose bouillon.

Symptoms and Complications.—In a paper on the *surgical complications* of typhus based on a study of 224 cases, R. Herzenberg[2] states that the number of complications was almost nil up to the eighth day of disease, when they began to rise up to the fifteenth day, on which there was a slight drop until the eighteenth day. There was then a fairly steep rise until the twenty-fifth day, followed by a daily fall until the thirty-fifth day, when there was another small rise; but no complications were noted after the fortieth day. Up to 10 years of age there were hardly any complications, from 10 to 15 they were relatively uncommon, and it was only from 15 onwards that they became fairly frequent. Up to 40 to 45 the frequency increased with age, the chief contingent being furnished by persons of ages from 25 to 45. Those of more advanced age (45 to 65) less frequently reached the stage of surgical complications; in other words, they more frequently succumbed before the sixteenth to eighteenth day. The following systems were affected by complications in order of frequency: skin, 88 cases; vascular system, 33; lymphatic system, 29; digestive system and urogenital system, 20 cases each; bones and joints, 14; respiratory system, 12; nose and ears, 8.

E. Fraenkel[3] reports a case of typhus in a youth, age 17, in whom the cause of death was *perforative peritonitis* due to a necrotic area in the fundus of the stomach. Microscopical examination of the affected part showed the characteristic typhus lesions in the walls of the arteries, involving not only the intima but also the muscular coat.

During the typhus epidemic of 1919–20 in Russia, N. Dobrovolskaia[4] saw a large number of cases with *costal osteochondritis* which was extremely refractory to ordinary treatment. The onset of the complication occurred in convalescence or for two to three months after the attack of typhus. Tuberculosis was probably the predisposing cause in most of the cases, while in a small minority syphilis was apparently responsible. Dobrovolskaia regards this form of osteochondritis as a special clinical entity, and not due to secondary infection, as no growth was obtained from the pus on ordinary media.

G. Delamare[5] draws attention to the *branny desquamation* of typhus. It may occur on the tenth day, but usually does not appear till between the twelfth and fifteenth at the time of defervescence. It may be even delayed till the twentieth to twenty-eighth day. It is often confined to the thorax or abdomen, but sometimes it is seen on the limbs and face. It may be of value in the retrospective diagnosis of typhus when the Weil-Felix reaction cannot be examined.

DIAGNOSIS.—In emphasising the importance of an early diagnosis of typhus among troops, Melville D. Mackenzie[6] points out that typhus is often mistaken for influenza when the first case appears in a unit at the beginning of the cold weather. The presence of catarrh, the leucocyte count, and the clearer mental condition of the influenza patient are distinctive. A diagnosis of cerebrospinal fever is also liable to be made, owing to the presence of Kernig's sign and increased pressure of the cerebrospinal fluid on lumbar puncture. A prodromal small-pox rash may also closely resemble the eruption of typhus, but in such cases evidence of recent successful vaccination is a guide.

K. Bauer[7] made a systematic examination of the Wassermann reaction in 50 cases of typhus in which there was no history of syphilis, and found that 46, or 92 per cent, were strongly positive. Of these patients, 21 had their blood examined again in convalescence, and, with the exception of one patient, who was suffering from pneumonia, all gave a negative result. Bauer concludes that the Wassermann reaction in typhus is almost always positive if the blood is examined before the crisis, and becomes negative again in convalescence. In cases in which the Weil-Felix reaction is not available and the diagnosis lies between typhus and typhoid, the Wassermann reaction may be of value, as Bauer has always found it negative in typhoid and paratyphoid.

G. Delamare[8] employed Friedberger's skin reaction (intense inflammation of the skin caused by subcutaneous or intracutaneous injection of small quantity of *Proteus* X19 in normal individuals and all diseases but typhus—(*see* MEDICAL ANNUAL, 1921, p. 487) in 5 cases of typhus, 14 of typhoid, and 2 of relapsing fever. Only 1 of the typhus cases showed no reaction, and in the other 4 the local reaction was definite, while the general reaction was only less durable than in the typhoid cases, in whom it was so violent as to contraindicate a general employment of the method. Delamare concludes that the reaction is far from being specific, and is of no value in a doubtful case.

Prophylaxis.—During the epidemics of 1918–19 and 1919–20 in Russia, J. M. Mitchell and G. P. N. Richardson,[9] in addition to the ordinary prophylactic measures, employed a **Vaccine** consisting of sterile blood taken from a typhus patient free from other diseases during the first three days of the rash. Three injections of this vaccine were given subcutaneously or intramuscularly at intervals of five to seven days in doses of 1 c.c., 2 c.c., and 2 c.c., without any general reaction being observed. Of 195 who were fully inoculated in this way, only one subsequently developed typhus, whereas out of 800 who were not inoculated at all or did not receive the full number of injections, 89 (11 per cent) developed the disease.

Treatment.—T. Hausmann[10] advocates **Sedative Treatment** in preference to stimulation, and therefore from the beginning of the disease gives **Bromides,** subsequently combined with small doses of **Morphia,** in an infusion of convallaria majalis, which besides its cardiac action has an undoubtedly sedative effect. If sleep cannot be obtained by bromides, some drug belonging to the fatty-acid series should be tried, such as **Veronal, Luminal, Medinal,** or **Adalin,** combined with morphia. Pain should be controlled by **Analgesics,** especially pyramidon.

A. Brenner[11] has had excellent results from the use of **Inhalations of Turpentine** or its derivative **Terpin Hydrate,** small plugs of cotton-wool moistened with the oil being inserted into the nostrils and changed frequently according to the intensity of the symptoms. This treatment was found to shorten the course of the disease, relieve headache and insomnia, and control restlessness and tremors.

E. Savini[12] used a **Vaccine** consisting of a mixture of cerebrospinal fluid and blood obtained from several typhus patients during the first six days of the disease. The method was as follows: First day, injection of 5 c.c. which had been heated to 55° C. for fifteen minutes, given in the morning, and 10 c.c. in the evening. Second day, 5 c.c. heated to 50° C. for an hour was given in the morning, and 10 c.c. in the evening. Third day, 5 c.c. of vaccine heated to 50° C. for half an hour injected in the morning, and 10 c.c. in the evening. The vaccine was subsequently injected daily in doses of 10 c.c. morning and evening until the temperature became quite normal. The effect of the vaccine was to produce a premature defervescence by lysis, and shorten the period of convalescence. No complications were seen in the cases so treated.

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## TYPHUS-LIKE FEVER IN INDIA.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

J. W. D. Megaw[1] describes a typhus-like fever occurring in the Kamaon Himalaya Mountains, which he believes is transmitted by the bites of ticks and is closely allied to 'Rocky Mountain fever'. He gives an abstract of an unpublished report by McKechnie, with temperature charts, on what he came to the conclusion was typhus fever, at Bhim Tal and Sat Tal. The disease had formerly been mistaken for typhoid, but the Widal tests were negative, and the course of the fever was twelve to fourteen days and accompanied by a typhus-like blotchy red rash, while the fever subsided more rapidly than in typhoid, and convalescence was short; the typhus smell had also been noted.

Megaw had previously described an attack of fever of a similar nature he contracted in the same area twenty days after being bitten by a tick. He points out that the disease occurs in persons residing in forest-surrounded houses where tick-bites are common, and suggests that the disease is a form of tick typhus possibly identical with that of the Rocky Mountains. The mortality is low, about 5 to 10 per cent. In a further note,[2] he suggests that the twelve-day fever of Nigeria described by W. Davies and Johnson[3] may be of the same nature, as it differs materially from dengue.

REFERENCES.—[1]*Ind. Med. Gaz.* 1921, Oct., 361; [2]*Ibid.* 371; [3]*Jour. Trop. Med. and Hygiene,* 1921, July.

## ULCER, PEPTIC. (*See* GASTRIC AND DUODENAL ULCER.)

## ULCER, TROPICAL. (*See* TROPICAL ULCER.)

## ULCERS, VARICOSE. (*See* VARICOSE VEINS.)

## UNDULANT FEVER. (*See* MALTA FEVER.)

## URÆMIA, NATURE OF.

*John D. Comrie, M.D., F.R.C.P.*

Uræmia still remains a debated subject, though some further light has been cast upon it by recent research. At a Congress of the International Society of Urology, held in Paris, Foster[1] gave a reminder that uræmia and azotæmia are not synonymous terms, because the syndrome uræmia ending in death has been observed without any notable increase in the concentration of the blood-urea. He states further that one can distinguish three types of uræmia: (1) The eclamptic form due to a specific toxin and accompanied by moderate azotæmia (increase in blood-urea); (2) The lethargic form due to slow intoxication by urea, creatinin, etc., accompanied by intense azotæmia; and (3) The serous form due probably to a serous encephalitis, accompanied by chloride retention.

Observations on the relation of urea to uræmia have been made experimentally by Leiter,[2] who found that injections of urea in dogs produce a train of symptoms entirely analogous to that found in true uræmia in man; he also found evidence that, when excessive amounts of urea are present in the blood, it is actively excreted by the stomach, bile, and intestine, and may produce lesions similar to uræmic colitis in man. This would correspond to the second type of uræmia described by Foster above.

Batty Shaw[3] concludes from clinical study that hyperpiesis, a malady in which blood-pressure rises excessively, and uræmia are really the same disease, due to the circulation in the blood of a poison or poisons which are not due to a fault of the kidney. This would correspond to Foster's first type of uræmia.

The nature of the poison productive of this type of uræmia has been investigated by Foster,[4] who was able to isolate from the blood, in twenty-two cases of epileptiform uræmia, a toxic base which, injected into guinea-pigs, is uniformly fatal. Symptoms of muscular twitching appear in five minutes, are often followed by convulsive seizures, paresis of the hind limbs, or bowel movements, and the animals pass into a stuporose state ending in death. Foster also found that this substance formed crystalline salts with platinum and gold. He experimented with the blood of over forty controls, and failed to produce toxic symptoms.

The suddenness with which uræmia sometimes develops is explained by von Monakow[5] as due to a sudden yielding of the choroid plexus. As long as the choroid plexus is normal, it serves as a protecting membrane to ward off toxic fluid from the brain; but when it becomes abnormally permeable, the brain is flooded with the noxious substances circulating in the blood-stream. He has found fibroid and other changes in the choroid plexus after death from uræmic coma. Scholl and Foulds[6] record a case of extraordinary urea retention in a woman, age 60, who, however, became stuporose only a few hours before death. At the first examination the blood-urea was 130 mgrm. per 100 c.c. of blood, and the creatinin 3·3 mgrm.; there was no excretion of phenolsulphonephthalein two hours after injection; gradually, in the course of four weeks, the blood-urea rose to 528 mgrm. and the blood-creatinin to 26·6 mgrm. per 100 c.c. of blood.

Chabanier, Marquezy, and Galhardo[7] draw attention to the fact that crises of hyperazotæmia lasting several days occur apart from uræmic symptoms, after which the blood may return to normal, or which may be the prelude to a fatal issue of the disease in which they occur. The diseases associated most commonly with this phenomenon are the infectious fevers, the consequence of an intoxication such as chloroform anæsthesia, cardiac decompensation, and still more the course of nephritis with a chronic azotæmia. They explain it as due in different cases to a simple excessive production of urea in the body, to insufficiency of aqueous diuresis in relation to the maximum concentration power of the subject concerned, or to an exacerbation of nephritis.

References.—[1]*Presse méd.* 1921, July, 586; [2]*Arch. of Internal Med.* 1921, Sept., 331; [3]*Lancet*, 1921, ii, 1307; [4]*Jour. Amer. Med. Assoc.* 1921, Jan., 281; [5]*Schweiz. Arch. f. Neurol. u. Psychiat.* 1920, June, 183 (ref. in *Jour. Amer. Med. Assoc.* 1920, Sept., 843); [6]*Jour. Amer. Med. Assoc.* 1921, Feb., 368; [7]*Presse méd.* 1921, June, 503.

## URETER, SURGERY OF.

*Sir John Thomson-Walker, F.R.C.S.*

*Bilateral Cystic Dilatation of the Lower End of the Ureter.*—Thomas[1] and Mellen discuss this condition, which they consider to be congenital in origin, the concomitant occurrence of stone in the lower ureter being secondary, and not the cause of the condition.

Two types can be recognized on cystoscopy: in the less severe, a cone-shaped tumour is seen at the site of the ureteral outlet, the orifice being at the apex, or pointing laterally, or posteriorly. In the more severe type the intramural portion of the ureter presents through the bladder wall as a distinct ridge, while the portion which protrudes into the bladder is club-shaped, and on it the orifice may open in any direction. Such a condition is symptomless until infection supervenes, when there may be aching in the loin. Not infrequently, they say, the pain is a colic which may be associated with vomiting. The mild type is best treated by ureteral dilatation with lavage of the pelvis, and the severe type by fulguration through the cystoscope. Experience has shown that surgical excision has frequently resulted in recontraction of the ureters. One case is reported in detail in which recontraction did not follow diathermy, as was demonstrated by cystoscopic examination one month later.

*Stricture of the Ureter.*—Green[2] states that stricture affords an explanation of some obscure abdominal conditions, and that it usually occurs: (1) Just below the renal pelvis; (2) 3 or 4 cm. below the pelvic brim; (3) In the 'broad ligament portion' of the ureter, the last being by far the most common site, whereas the first is extremely rare. Most writers consider the acquired type to be by far the most frequent. The congenital type is thought to be due to the persistence of fœtal valves or to actual twists in the ureter, and it is frequently associated with other anomalies of the kidney and ureter, such as failure of the kidney to ascend or to rotate. The acquired type may be of extrinsic or intrinsic origin. Extrinsic causes are pressure on the ureter by tumours, abnormal renal vessels, or traumatism of the perirenal tissues. The intrinsic causes are tuberculosis, bilharziasis, calculus, malignancy, or pyogenic infection. Syphilis must always be borne in mind, but pyogenic infection is by far the most frequent cause.

The colon bacillus, staphylococci, streptococci, and gonococci are the organisms most frequently found. Sometimes a severe ureteritis, trigonitis, or urethritis without stricture is found, or one or all of these conditions, associated with stricture and dependent upon a focal infection elsewhere, may be met with. As a rule the effect of ureteral stricture on the kidney and ureter is a gradual dilatation, but sometimes atrophy of both occurs.

The most characteristic symptom is pain, due to distention of the ureter and renal pelvis. It may be acute or dull, constant or intermittent, referred to the pelvis, the posterior renal region, or along the course of the ureter or even to the opposite posterior renal region, the sacro-iliac, epigastric, or gall-bladder area, or often down the back of the thigh. It may last for years, being aggravated by each recurrence of pyelitis, or at the menstrual period. Other symptoms are gastro-intestinal disorders, especially mucous colitis and dyspepsia depending on chemical disturbance of the gastric juice, and less frequently mental depression with all sorts of nervous states.

The physical signs are generally intermittent, and consist of frequency by night as well as by day, and tenesmus. There is usually a history of urinary symptoms for some years, these not uncommonly dating from childhood. Examination for pus and blood and cultivation of the urine are as often negative as positive; but the author has found these investigations to be positive during acute exacerbations, when fever may be present in addition, indicating poor drainage of the renal pelvis. Insertion of a ureteric catheter for twenty-four hours, he finds, gives relief. If and when a catheter can be passed, a steady stream of urine is very suggestive of hydronephrosis and stricture. The normal rate of urine, drop by drop, is seventeen drops a minute. Extreme pain when the catheter passes through the area of urethritis or stricture, and free bleeding from the mere passage of a catheter, are other suggestive signs.

Distention of the renal pelvis and ureter with fluid, and the measuring of the return fluid, is a valuable diagnostic aid, and during its performance the patient often complains of pain similar to that from which she has suffered for years. The most definite means of diagnosing a stricture is the passage of a catheter tipped with a wax bulb. Obstruction met with on introduction is of little value as compared with a definite 'hang' and grating sensation felt as the wax bulb is withdrawn through the stricture. Finally, a pyelo-ureterogram is taken to corroborate or otherwise the previous findings and to furnish a standard for future comparisons.

As regards treatment, the passage of a catheter with a wax bulb should be done not oftener than once in eight or ten days, depending upon the amount of reaction after treatment. The renal pelvis is irrigated before the catheter is removed, and for this purpose the author uses a 1 per cent solution of silver nitrate. Frequently a marked reaction after the gentlest of treatment occurs, and this of itself is suggestive of ureteritis and stricture.

*Non-operative Treatment of Ureteral Calculus.*—Buerger[3] considers that cystoscopic intervention is advisable in almost all cases of ureteral stone within a short period of the entry of the stone into the ureter.

The acute pain in most instances is due to distention of the renal pelvis and ureter with retained urine. The immediate lesions as well as the complications can be best combated by the establishment of drainage by catheter through the ureter alongside the calculus. Ureteral calculi more than a quarter of an inch in diameter are frequently arrested in the well-known narrow portions of the ureter, and become impacted, with subsequent dilatation of the ureter above, secondary infection, and destruction of the kidney. Even small stones over $\frac{1}{8}$ in. in diameter may be similarly arrested. It is not possible to predict in which cases such impaction with blockage will occur. By the passage of one or more ureteral catheters, of bougies and catheters, or bougies alone, ureter drainage can be established and a definite effect produced upon the descent of the stone; even large stones half an inch in diameter can be so dealt with, effectively preventing complications and relieving pain.

In the author's experience, the greater the distance between the stone and the kidney, the less the chance of severe infection and extensive destruction of the latter; therefore it is most important to further the passage of the stone to the lowest possible part of the ureter.

Two classes of cases may be recognized: (1) Those with a calculus in the lower pelvic ureter (true pelvis); (2) Those with a stone in the lumbar ureter (false pelvis). In the first class the procedure depends upon whether the obstruction met with is passable or impassable. If passable, when the catheter meets the obstruction it is rotated on its long axis and, if necessary, withdrawn and reintroduced. Having finally surmounted the obstacle and evacuated the contents of the ureter and pelvis, a single catheter may be allowed to remain for an hour or so, or a second catheter is passed, if possible beyond the stone, the latter being the method *par excellence*. The procedure is difficult and requires patience, and may be accompanied by the injection of olive oil or glycerin into the ureter. Having succeeded in passing the two catheters beyond the obstacle, they should be introduced 25 cm. or more, so that in withdrawing the cystoscope they may not be dislodged into the bladder. The catheters are left to drain for an hour or more. Their removal is an important step; both should be pulled out simultaneously, when considerable resistance may be encountered. The author considers that adhesion of the catheter to the stone takes place sometimes, but that it is by friction that the stone is usually dislodged. Where catheters cannot be passed at first, filiform bougies may be used until dilatation is sufficient to allow the passage of first one and then a second catheter. Uninfected cases may be treated in this fashion as out-patients; but in the presence of a not too severe infection indicating operation, it is best to keep the patient in bed during the inlying of the catheter. Silver nitrate irrigations of the renal pelvis are recommended both after evacuation of the renal pelvis and before removal of the catheters. When impassable obstruction is apparently present, the ureter below is injected with oil or glycerin, with or without adrenalin and novocain, and a catheter is introduced and followed by one or more small bougies (3 or 4 F.), which are passed up with a view to passing the obstruction. If these fail, olivary dilators are introduced into the ureter, the lumen being gradually dilated by the successive employment of olives of increasing size. These are well lubricated with vaseline, and, when carefully used and rotated on their long axis, will frequently, with patience, be made to pass the obstruction. The author recommends treatment on the above lines at weekly intervals in uncomplicated cases.

With stone in the lumbar ureter the problem is somewhat more difficult, because the impaction is less easily surmounted, and a small calculus may occasionally be pushed back into the pelvis of the kidney. However, the general methods employed are the same, except that greater care must be exerted to prevent withdrawal of the catheters as the cystoscope is removed.

When by any of the above methods a calculus of considerable size has been dislodged and has become arrested in the intramural portion of the ureter for some time, particularly when there is protrusion and marked œdema of the ureteral lip, the upper lip of the ureter can be incised with scissors, the stone grasped with forceps and directly removed, or dislodged into the bladder and extracted with an evacuator.

*Pelvic Uretero-lithotomy.*—Battle[4] states that there has lately been a tendency to use the intraperitoneal route. He mentions Witherspoon, who opened the peritoneum to localize the stone, and then, carefully closing the peritoneum, extracted the stone extraperitoneally; and Gibbon, who advocated a combined intra- and extraperitoneal operation in doubtful cases, and in all cases where a stone is found in the ureter when the abdomen has been opened for some other condition.

In three adults in whom impacted stone in the pelvic ureter was diagnosed, Battle employed the following technique: An oblique incision from midway between the anterior superior spine and umbilicus is made towards the pubic spine. The rectus sheath is opened, and the rectus freed, and retracted inwards. The deep epigastric vessels are divided and tied off. The posterior rectus sheath and peritoneum are incised in the upper part of the wound, the viscera packed off, and the left hand carried to that part of the ureter which has been shown by $x$ rays to contain the stone. After location of the stone, the right hand is worked extraperitoneally to the same spot, separating the peritoneum a little above and below it, and the ureter incised cleanly over the stone. The advantages claimed for this procedure are: the ease with which the stone can be lifted upwards and forwards with the ureter, and if possible, displaced upwards; the firm fixation of the stone with the left hand which allows of a precise incision, avoiding any accompanying artery; and, finally, the control given, which renders one less likely to break up the stone when making the opening for its removal. The peritoneum is closed and the muscle sutured over it, drainage of the site of the incision in the ureter being provided for, through the lower part of the abdominal wound. [The easiest method, and that which is followed by those who have frequently to operate on the pelvic segment of the ureter, is a median suprapubic incision and extraperitoneal exposure of the ureter. The patient is placed in the Trendelenburg position, and the peritoneum stripped from the affected side of the pelvis. This gives direct access and free exposure, does not open the peritoneum, and permits of drainage without danger of pressure on the iliac vessels.—J. T.-W.]

Rafin[5] describes twenty cases of ureteric calculi treated by operation. He emphasizes the point that the injury caused by the impacted calculus predisposes to infection later, so that the urine must be kept under observation. If the calculus was of the 'constitutional type' the diathesis should be treated; if of the 'organ type' the urinary passages should be kept open and disinfected.

*Uretero-ureteral Anastomosis.*—McEachern[6] describes a modification of Van Hook's method in which the upper end of the divided ureter is not slit, but is implanted into a longitudinal incision on the outer aspect of the distal portion, the lumen of which has previously been closed by suture at its free end.

*Ureteral Diverticulum.*—Hale and von Geldern[7] describe a case in a man, age 37, who complained of pain over the left iliac fossa about one inch from the anterior superior spine, which was associated at times with nausea and vomiting, and was first noticed seven years before. He had had in all six attacks, progressive in severity, in the more severe of which the sharp and colicky pain was, in addition, associated with frequency and prostration. Cystoscopy was negative. Ureteral catheterization showed the left ureter occluded about 10 cm. from the ureteral orifice; the right ureter was free from obstruction. On $x$-ray examination, an oval shadow was seen lying diagonally over the first sacral vertebra, within which lay the tip of the catheter. The diagnosis was a dilated ureter, probably congenital. The attacks of pain were thought to be kinking of the ureter. At operation an appendix-like projection, attached to the ureter by loose adhesions, was found about 10 cm. from the bladder. This was ligated and removed.

*Extravesical Implantation of a Simple Non-supernumerary Ureter.*—Puppel[8] records a case and its treatment. He finds that only twenty normally placed but extravesically implanted ureters have been reported. His own case was that of a girl, age 20. The right ureter opened into the vaginal vault. Cystoscopy showed the left ureter only opening into the bladder. A cuff of mucosa around the vaginal orifice of the abnormal ureter was excised, left attached to the ureter, and fastened by three sutures into the edges of an incision into the bladder. The subsequent functional result was good. Seventeen such cases in which vaginal operation was done are reported in the literature.

Judd and Struthers[9] report one case of *papillary epithelioma of the ureter*, and review twenty-five cases recorded in the literature.

References.—[1]*Surg. Gynecol. and Obst.* 1921, Dec., 498 (abst.); [2]*Ibid.* 1922, March, 388; [3]*Med. Record,* 1922, April 1, 525; [4]*Brit. Med. Jour.* 1921, ii, 6; [5]*Jour. d'Urol.* 1921, June, 425; [6]*Ann. of Surg.* 1921, July, 92; [7]*California State Jour. Med.* 1921, xix, 284; [8]*Zentralb. f. Gynäkol.* 1921, xiv, 667; [9]*Jour. of Urol.* 1921, Aug., 125.

## URETHRA, DISEASES OF.

*Sir John Thomson-Walker, F.R.C.S.*

*Non-gonococcal Urethritis.*—Spittel[1] states that difficulty is found in those cases in which other diplococci are found very similar in form and distribution to the gonococcus: or when in a persistent gleet secondary organisms obscure the picture of a latent gonorrhœal infection. This is because there are, in the male urethra, diplococci other than the gonococcus, morphologically identical with it; and others very like the gonococcus in shape which share with it its characteristics of intracellular grouping and being Gram-negative. The Gram stain is not always reliable, for many organisms take this strain equivocally, not excepting the gonococcus under certain conditions. For these reasons it is wise to make methylene or thionin blue specimens to confirm the findings. Further, cultivation does not always furnish a sure test in the class of case in which an appeal to it is most necessary, for if gonococci are hard to grow under the most favourable circumstances, how much more is this the case when a few gonococci are associated with a host of other organisms. This test has its most useful application when diplococci indistinguishable from gonococci are found to give on ordinary culture media abundant growths which show them to be not gonococcal.

Spittel discusses the following varieties of non-gonococcal urethritis:—

1. Aseptic, in which no bacteria are found in the discharge produced by the injection of strong chemicals, the passage of irritating crystals, certain food, and excessive sexual intercourse. As regards the last, he quotes Luys as stating that on examination of the women responsible for the discharge, he has never failed to find a pathological condition such as metritis or salpingitis, etc.

2. Bacterial. Innumerable varieties of organisms may be found in the discharge in these cases; the pyogenic bacteria may give rise to an acute discharge which is infectious, and prostatitis, epididymitis, and vesiculitis may occur. The similarity to gonorrhœa is very close, but the course is less acute and more persistent. Staphylococci are most commonly the cause of this type of infection. While their grouping is typical, they sometimes fail to retain the Gram stain.

Wyndham Powell[2] describes a modification of his *urethroscope* which allows of more precise technique when operating in the anterior urethra under air-distention. The principal instruments employed are various probes, a knife, flexible metal bougies, filiform gum-elastic bougies, and a probe and cautery for use with the open prostatic tube.

*Impacted Calculus in the Urethra.*—Jacobs[3] describes a non-operative technique for its removal. It consists in the passage of from 15 to 20 olive-tipped filiform whalebone bougies down to the point of obstruction in the urethra, with all the usual precautions. The bougies are now manipulated so that they pass a little beyond the stone and surround it ; then they are all grasped together and pulled out rather firmly and quickly. In this way the calculus is caught as if in a cradle, and comes along when the bougies are withdrawn ; the bougies, moreover, act as a covering to the rough surface of the calculus, and prevent injury to the mucosa during withdrawal. If the condition was complicated by the presence of an organic stricture, the efficacy of the method would depend on the calibre and resilience of the stricture ; however, the method should at least be tried.

*Urethral Traumatism.*—In a paper on the treatment of this condition read before the International Society of Urology, Pasteau and Iselin[1] draw the following conclusions :—

As regards *recent trauma*, if in the penile urethra, no procedure can be relied on for the certain prevention of a traumatic stricture in the future. In the perineal and scrotal urethra, spontaneous repair allowed to take place on an indwelling catheter is no safeguard from stricture ; urethrorrhaphy without the provision of drainage of the urine is occasionally successful, but as a rule stricture ultimately occurs even if the suture holds fast. If, however, drainage of urine is provided for, complete cure without the necessity for continuous dilatation ensues in the majority of cases. Healing is rapid, occurring usually in about a month ; at times, however, the associated fistula, perineal or suprapubic, may remain open and compel further intervention. It may happen that kinking, dislocation, or absence of end-to-end alinement of the urethra may make micturition or catheterization impossible, and necessitate another operation.

Autoplastic urethral repair, with perineal urethrostomy, gives the same results as urethrorrhaphy with drainage : complete and definite cure in the majority of cases. The cure is slower, usually about two months, but the rest of the urethra and bladder remain untouched, and even if a small perineal fistula occurs, micturition is always easy and no stricture formation takes place. In the membranous urethra no method of treatment offers a certain protection against ultimate stricture. Primary treatment of lesions of the prostatic urethra is necessarily limited to suprapubic drainage or to the insertion of an indwelling catheter, with resulting stricture and more or less extensive fistulæ.

*After-results of traumatism, including stricture*, are treated, in the case of the penile urethra, by excision of the stricture ; but primary union will be doubtful in the absence of a self-retaining catheter, so that perineal or suprapubic drainage is necessary, and this, with vascular or mucous-membrane grafts, may allow of complete repair of the urethra, even after extensive excision.

In the perineal or scrotal urethra, treatment by dilatation or internal or external urethrotomy may be sufficient in slight cases, or may be used as a part of a more important operative process.

Urethral excision without drainage may be attempted by suture of both ends of the urethra or by placing several rows of perineal sutures without any in the urethra itself. Success after these proceedings is, however, only relative, and is contingent upon the continuance of regular dilatation afterwards.

Suprapubic drainage, which is preferable to perineal drainage, or alternatively perineal urethrostomy with the bringing together to the skin of both ends of the urethra, are methods which obviate the formation of peri-urethral scar tissue after excision. These two operations may be followed by complete cure, the lumen remaining wide and free from induration without the need of any dilatation, and the peri-urethral tissues remaining movable and supple.

Plastic operations must always be safeguarded by provision for drainage of the urine suprapubically, and under these conditions excellent and durable results may be expected after extensive excision.

Traumatic strictures of the membranous urethra may be treated by urethrostomy and perineal autoplastic operations. More often, however, these strictures, and especially those of the prostatic urethra, require more or less extensive excisions, with or without suture—difficult and complicated operations which may only be possible after separation of the ischiopubic attachment of the triangular ligament. When a measure of success is attained, it is usually incomplete, and subsequent dilatation is necessary to maintain a satisfactory calibre of the urethra.

Kidd,[5] in a paper read before the International Society of Urology, describes the end-results of 57 cases of *rupture of the urethra* at the London Hospital. It is an uncommon injury, hardly ever fatal, and usually followed by a stricture of a certain degree of severity. He states that the most accurate method of judging end-results is to employ the aero-urethroscope, which should replace all other methods in the diagnosis of stricture. The severity of a traumatic stricture is determined rather by the force of the blow than by any other factor, such as the type of operation or the use of a tied-in catheter. For the first year or so after operation results seem unsatisfactory, but in the end they turn out to be extremely good. Twenty-five cases of ruptured urethra were followed up completely; of these, 24 are still alive and have progressed as follows: 22 have clear urine (90 per cent)—yet 17 of these have had long bougie treatment; 16 have been able to give up bougie treatment, and 19 can be considered as practically cured (76 per cent); 18 of these have non-progressive strictures—only one could be proved to be stricture-free; 5 have progressive strictures and still need bougie treatment. Out of a total of 44 cases, 36 regard themselves as symptoma ic cures. The results in 13 cases of fractured pelvis with ruptured urethra are as follows: 6 died at once; 3 are comfortable, but have to pass bougies regularly; 3 are symptomatic cures; 1 is left with a permanent suprapubic cystostomy.

*Defects of the Urethra.*—Budde,[6] in a paper on the *plastic reconstruction of ducts lined with mucosa*, states that there are four methods of treating such defects. In the first, no suturing is done, a catheter being used until regeneration of the urethral epithelium takes place. This method can be applied successfully only to cases in which suppuration has not persisted very long and in which there is no great degree of injury to the tissues. In defects made by operation there should be little or no drainage, and whenever possible a bridge of mucosa should be preserved.

The second method, mobilization of the urethral stump and circular suture, is the method of choice, and is useful in the anterior and posterior urethra. The traumatic stricture is easier to treat than the gonorrhœal, because in the former, although the scar is dense and its transverse diameter is considerable, it is not so long as in the latter, so that the surrounding cicatricial tissue should be removed entirely. By this method, gaps of 3 to 4 cm. in the anterior, and up to 9 cm. in the posterior, urethra can be bridged.

The third method consists of the use of flaps. Budde prefers those attached to their original site by a broad pedicle. He has modified two earlier methods of flap operation. One is used in the plastic reconstruction of the penile urethra in hypospadias. The scrotum is shaved and the position of the penis corrected. The channel and mouth of the urethra are freshened, a rectangular flap corresponding to the line of the urethra is cut from the scrotum, and the mobilized edges of this flap are sewn over a catheter to form a tube, the central end of which is sutured to the old opening of the urethra. The tube is fastened with buried sutures along the channels of the urethra, and the wound is closed by uniting the cut edges of the penis and scrotum, so that the newly-formed urethra is buried. In this way the scrotum is freed from the penis.

The other flap operation is used on the posterior urethra. A tube formed of skin from the scrotum is left attached by the broad pedicle to the raphe of the scrotum, and forced under a bridge of perineum into the defect, where it is sutured around a retained catheter.

The fourth method consists of the transplantation of tubes made of Thiersch flaps, veins, fascia, or the appendix, which serve essentially only as conductors for the regenerating epithelium. The results of this method are not nearly so good as those of the third, as in both traumatic and inflammatory defects wound infection occurs very readily.

Pages[7] describes Cathelin's method of the treatment of *fistulæ* by inversion of the skin, with special application to fistulæ of the male urethra. A large catheter is inserted into the urethra. The skin flap is dissected loose, working inwards and downwards, from the periphery, to form a funnel reaching down nearly to the mucosa. The circular skin flap is then slit at top and bottom, and each of the two flaps so formed is rolled up on itself, raw side outwards. These two straight rolls are then sutured together, and finally the skin is sutured over them. Careful after-treatment is required in order to prevent stricture formation. He describes four cases treated in this way, in one of which the lumen has become smaller and now requires dilatation.

Lichtenberg[8] advises suprapubic cystotomy in treating the *complications of urethral stricture*. He has now a record of 6 cases so treated, and urges the routine suprapubic drainage of the bladder in such conditions to give the urethra a chance to heal.

Rizzi[9] adds one more to the 52 cases of *primary carcinoma of the male urethra* which he has found on record. In his case the primary lesion was in the bulb of the meatus, in a man of 49, with urethral obstruction, painful micturition, and bleeding from the urethra. Extirpation of the penis and inguinal glands was facilitated by slitting the scrotum along the raphe. The patient has been free from symptoms until just recently, seven months after the operation, when a small tumour, presumably a recurrence, was felt in the perineal scar.

*Tuberculosis of the Penis or Urethra.*—Peters[10] considers this condition to be more frequent as an extension of urogenital tuberculosis than is supposed, but it is usually overshadowed by the associated process higher up. Primary urethral tuberculosis, however, is rare. He states that it is acquired by children at circumcision, and by adults during sexual intercourse, or as a hæmatogenous infection ; occasionally it is associated with gonorrhœa or syphilis. To the two cases of hæmatogenous tuberculosis of the penis reported in the literature, which were primary in the sense that no other localization of the disease could be found, the author adds a case of his own. At the external meatus was a tuberculous ulcer, and 6 cm. behind this the urethra was constricted. A Pezzer tube suprapubically, and exposure to *x* rays locally, relieved the pain and caused improvement.

The development of secondary tuberculosis of the penis is relatively common when the rest of the genito-urinary tract is involved by the disease. Extension may take place by the lymph-stream or along the surface of the mucosa. Injury of the epithelium, such as might be caused by catheterization, favours the localization of tubercle bacilli. Strictures of tuberculous origin may develop, and may lead to extravasation of urine and the formation of urinary fistulæ.

*The Verumontanum.*—In a clinical study Martin[11] gives embryological, anatomical, and physiological details of this structure, which he considers to be the most important portion of the posterior urethra. All infections of this part of the urethra affect the verumontanum more or less ; in many cases the latter is itself the site of infection. In all cases of chronic posterior urethritis the verumontanum and prostatic urethra should be carefully examined through the urethroscope, since confusing symptoms result from disease of the verumontanum, leading to the belief that the seat of the trouble is in the neighbouring parts, such as the remainder of the posterior urethra, the prostate, and seminal vesicles.

The verumontanum may give rise to urinary symptoms. The author cites two cases illustrating this fact. In the first there were symptoms suggesting cystitis, with severe pain during micturition. Examination showed an inflamed verumontanum which filled the posterior urethra and bled very freely. The other was a middle-aged patient who for four years had suffered with retention of urine following nervous exertion. An enormous verumontanum was found to be obstructing the prostatic urethra. As regards treatment, he advises fulguration, and if local application of silver nitrate is used, only in the very resistant cases should a solution stronger than 10 per cent be employed.

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## URTICARIA.

*E. Graham Little, M.D., F.R.C.P.*

Lambright[1] attempts a classification of urticaria with special reference to sensitization cases, and offers the following table :—

Urticaria

- *Non-sensitive to proteins :*
  1. Neuropathic
  2. Chemical
  3. Constitutional
- *Sensitive to proteins :*
  - Seasonal :
    1. Pollens
    2. Bacteria
    3. Foods
    4. Animal proteins
  - Non-seasonal :
    1. Foods
    2. Bacteria
    3. Animal proteins

The author uses cutaneous tests in making these differentiations, the technique of which is thus described : " The skin surface, preferably the forearm, is cleansed with 40 per cent alcoholic solution. Abrasions ⅛ in. long are made with a sharp scalpel. A small amount of protein of food, animal, bacteria, or plant in solution, is placed thereon. Solution is either made by adding a drop of 1–10 sodium hydrate solution to the powder, and mixing on abrasion with a toothpick, or solution made on a watch-glass and placed on the cut. Within ten to thirty minutes, if the reaction is positive, a small wheal develops, which may or may not be accompanied by an area of erythema and swelling. One of the abrasions is left as a control, and by this method a comparison of the natural reaction to a cut and the application of the soda solution may be obtained. Wheals less than 0·5 cm. in diameter are not considered positive. According to the amount of reaction a classification may be made from 1+ to 4+ ". Unhappily the author has encountered the experience of many other observers, who find that the withdrawal of the item incriminated by the skin test is frequently without any marked influence on the eruptions, and this is especially true in the case of adults.

REFERENCE.—[1] *Amer. Jour. Med. Sci.* 1921, Aug., 183.

## UTERUS, GROWTHS OF. (*See* ADENOMYOMA; MYOMA.)

## VACCINATION. (*See also* SMALL-POX.)

*J. D. Rolleston, M.D.*

EPIDEMIOLOGY.—V. G. Heiser[1] states that the value of vaccination and its comparative harmlessness have perhaps never been more completely demonstrated than by the experience in the Philippine Islands, where for many years small-pox caused more than 40,000 deaths annually, until systematic vaccination of all the inhabitants caused the disease to disappear. Thus, after vaccination of the inhabitants of the six provinces in the vicinity of Manila which had an annual mortality of 6000 from small-pox, the deaths from this disease were reduced to insignificant numbers. In Manila, with a population of over 250,000, not one death from small-pox occurred in a period of seven years. On the other hand, between 1915 and 1919, when the vaccination of new-born children and new arrivals in Manila was not effectually carried out, the disease promptly reappeared, and in the summer of 1918 over 700 deaths from small-pox were reported in Manila alone. More than ten million vaccinations were performed between 1905 and 1915 without loss of life or limb, showing that vaccination in itself is practically unattended with any risk.

SYMPTOMS.—W. Hedrick[2] reports a case of *vaccinia of the tonsil* in a child, age 9 months, who had been admitted to hospital as a case of diphtheria. There was a dirty yellowish-white deposit on the right tonsil, accompanied by enlargement of the submaxillary and cervical glands. Temperature 103·4°. Smears taken from the tonsil showed no diphtheria bacilli, fusiform bacilli, or spirilla, but only streptococci and numerous Gram-negative diplococci. The throat became clean in ten days. The diagnosis of vaccinia of the tonsil, which was suggested by the history of the sister who had recently been successfully vaccinated having thrust her finger into the infant's mouth, was confirmed by the vaccination performed four weeks later proving unsuccessful, although other children vaccinated with the same lymph developed good pustules.

A. Schalek[3] records a case in a girl, age 10, of *vaccinia of the lip* which developed at the site of a herpetic vesicle a week after a typical vaccination lesion on the leg. The lesion on the lip had the characteristic appearance and all the features of a syphilitic chancre, including cartilaginous induration of the tissues, indolent regional adenopathy, and the absence of pain. The Wassermann reaction was negative on three occasions, no spirochætes were found, and no secondaries developed.

C. Schneiter[4] reports a case of infection of a wound with vaccine virus in a girl of 10 who had injured her arm as the result of a fall. At the time of her accident a large number of children in the same class, including the girl sitting next to her, had been recently vaccinated. Ten days after the fall the wound presented all the appearances of a successful vaccination, and healed without further complications. Two subsequent vaccinations proved unsuccessful.

The danger of vaccinating children suffering from skin diseases, especially eczema, owing to the liability of generalized vaccinia ensuing, is well known. Guinon and Hallé[5] report a case showing that fatal vaccinia may be contracted accidentally, and that death may occur although the eruption is far from being generalized. Their patient was a male infant, age 1 year, and one of twins, whom a doctor had refused to vaccinate owing to the presence of eczema of the face and scalp, though he successfully vaccinated the twin sister who shared the same cot. When the patient was seen by Hallé sixteen days after vaccination of the other child, the whole of the face and scalp, except the tip of the nose, upper lip, and chin, was covered by the pustules of vaccinia. There were no lesions on the rest of the body. There was much constitutional disturbance, and death took place, preceded by convulsions. Nothing remarkable was found post mortem.

According to G. Morawetz,[6] statistics as to the results of *vaccination in the newborn* show that insusceptibility to vaccinia is more frequent at this age than later. Although Wolff claimed invariably positive results in vaccination of 46 infants between the first and sixth days of life, Franz and Huhner reported failures in 36·5 per cent among 300 infants within the first five days of life whose mothers had been successfully vaccinated during pregnancy. These results appear to confirm the view held by Huguenin and others, that some newborn infants are refractory both to variola and vaccinia owing to the mothers' immunity, which has been conferred by vaccination. Morawetz recently had an opportunity of observing the reaction to vaccinia of newborn children in an institution where an infant was admitted suffering from small-pox. Of 14 newborn children who were exposed to infection and were vaccinated as soon as the diagnosis of small-pox was established, all but 2 failed to 'take', and only 8 contracted small-pox, while the 2 successfully vaccinated and 4 others escaped. But even those who developed small-pox showed a partial immunity to the natural infection, as only 2 had a typical attack and died, the disease in the other cases being of a mild character.

J. Dumont[7] reports a case suggesting a *relationship between vaccinia and herpes zoster*, similar to that between chicken-pox and herpes, in a man, age 65, who seven days after vaccination developed an ecchymotic and gangrenous intercostal zoster.

Technique.—Leiner and Kundratitz[8] have employed an **Intracutaneous Method** of vaccination, which they claim combines the advantages of subcutaneous inoculation such as absence of pustulation and scar formation and avoidance of such sequelæ as eczema vaccinale and vaccination of the cornea, with the advantage of cutaneous vaccination, viz., a visible reaction. In no case did necrosis of the skin occur. The method consists in intracutaneous injection of lymph diluted in saline solution. Twenty-four hours after injection a small infiltration of the skin appears, surrounded by a pale-red areola, and subsides in another three or four days. The true vaccinal reaction occurs between the tenth and fourteenth day, and consists of an infiltration followed by redness of the skin. The appearances resemble those of ordinary vaccination except that pustulation is absent. The reaction runs its course without any special symptoms or rise of temperature. No bad effects were seen by the writers. A proof of the immunity conferred by this method is supplied by the subsequent performance of the ordinary cutaneous vaccination in such cases, when either no reaction at all occurs or only small nodules are formed. When intracutaneous revaccination is performed a reaction occurs within twenty-four hours, consisting of a doughy œdema and a small central infiltration. The intracutaneous method is specially indicated in vaccinating persons suffering from skin diseases, or infants whose brothers or sisters are so affected.

References.—[1]*Amer. Jour. Public Health*, 1921, 142; [2]*Münch. med. Woch.* 1921, 1119; [3]*Jour. Amer. Med. Assoc.* 1922, i, 509; [4]*Schweiz. med. Woch.* 1922, 1071; [5]*Bull. Soc. de Péd.* 1921, 312; [6]*Wien. klin. Woch.* 1921, 129; [7]*Bull. Soc. méd. Hôp. de Paris*, 1921, 1036; [8]*Wien. med. Woch.* 1921, 1894.

## VARICELLA. (*See* Chicken-pox.)

## VARICOSE VEINS.

*Drs. C. Lian and R. Barrieu.*
*(Translated by Carey F. Coombs, M.D., F.R.C.P.)*

TREATMENT.—Sicard, Paraf, and Forestier[1] have given up injecting carbonate of soda into varices, because escape of a few drops of the solution outside the vein may cause necrosis. One woman so treated died suddenly the day after injection. No other such case has been recorded, and in the absence of an autopsy there is room for hope that it was a coincidence and not a case of embolism of venous origin. They have supplanted carbonate of soda by **Sodium Salicylate**, 30 per cent solution, 2 c.c. of which are injected into the varix. They have no fear of necrosis, but Coury[1] thinks it may occur, judging from his experience of intravenous injection of salicylate of soda in acute rheumatism.

Genevrier[2] injects neutral **Hydrochloride of Quinine**, made up in ampoules containing 0·4 grm. with 0·2 grm. of urethane in 3 c.c. of distilled water. The patient sits on a high table with his legs hanging down, and his feet resting on a stool. A 2-c.c. syringe is filled with the solution as above, and, after sterilization of the skin with tincture of iodine (5 per cent), the varicosities are punctured, beginning with those at the foot. At intervals of about 5 cm. $\frac{1}{5}$ to $\frac{1}{4}$ c.c. is injected, so that a whole limb is treated by a single syringeful—seven or eight injections.

The other leg may be treated with a second syringeful, or postponed for a later sitting. A week later, veins overlooked or inadequately reduced may be similarly treated, the whole course being completed in two or three sittings. It is advisable to let the patient lie up for two or three days after each sitting, but it is not absolutely necessary, and several of Genevrier's patients have carried on with their work. By this method he has been able to check recurrent hæmorrhages from rupture of varicosities.

In cases of varicose ulcer, he makes the patient lie down, and begins the injections several centimetres from the periphery of the ulcer. Later he completes his series of injections in proportion as the ulcer shrinks or spreads.

As a rule, immediately after the injection there is a hard and tender swelling of the vessel ; the skin is red over the course of the vein. The patient feels a sense of weight in the veins treated. After an interval varying from one to four months the injected veins shrink and disappear almost completely. According to Genevrier the advantages of this method are absence of visible scar, simple and harmless technique, immediate thrombosis without fear of embolism, and a possibility of treating ulcers.

We still feel some hesitation about using these coagulating injections in slighter cases of varix, for time alone will show whether there is really no risk of embolism. But where the usual measures have failed and the patient is seriously hampered in the pursuit of his occupation, this method appears to us justifiable, and indeed preferable to surgical treatment, which adds the risk of an anæsthetic to that of an embolism. One of us has had under his care a case of pulmonary embolism occurring three or four days after excision of varicose veins of the leg.

REFERENCES.—[1]Congr. Français de Méd. Paris, 1922, Oct. ; [2]*Monde méd.* 1922, Oct. 1.

## VARICOSE VEINS AND ULCERS.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

*Operative Treatment of Varicose Veins.*—Hesse and Schaack[1] conclude from their extensive experience at Petrograd with implanting the saphenous vein in the femoral vein according to Delbet's method (1908) that it is logical and feasible, and conforms to the anatomical and physiological conditions. They have applied it in 115 cases, but in 25·6 per cent the results were disappointing, and hence they do not unconditionally recommend the method, especially as the outcome of Madelung's saphenectomy seems to be equally good. They applied this in 20 cases, and the results were excellent on the whole. By carrying the resection high up into the oval fossa the outcome will be even better. They applied Babcock's extraction method in 25 cases, and were satisfied with the outcome. Unfortunately this method cannot be applied when the walls of the vein are friable. Rindfleisch's spiral incision was made in 17 cases in which the varices encircled the entire circumference, and the results were good except that circular callous ulcer sometimes showed but little influence from it. Their study of the subject with 18 illustrations fills 83 pages.

*Varicose Ulcers.*—Grove and Vines[2] suggest that varicose ulcers may be due to a deficiency of ionized calcium. Treatment by intramuscular injections of **Calcium Chloride** was tried, but the results were uncertain. Later, the injections were supplemented by the oral administration of thyroid gland; the results were still unsatisfactory. **Parathyroid Gland Substance** (Parke Davis) $\frac{1}{10}$ gr. by the mouth was next used, and with this treatment an immediate improvement seemed to take place. The ionized calcium of the serum rose rapidly to the normal figure, and the local condition showed early signs of healing. It was found unnecessary to continue the calcium injections. Seven to fourteen days seemed to be the period required for the parathyroid to produce its maximum effect.

In putting this treatment into practice, parathyroid $\frac{1}{10}$ gr. is given daily until healing is acquired, and afterwards twice a week for three or four weeks. The best results are obtained when the patient is kept in bed. Early cases treated with parathyroid and confined to bed heal with remarkable rapidity.

A very interesting paper is concluded by the statement: It is not yet possible to state that all chronic non-malignant ulcerative processes are of the same type. It has, however, been found in the small number of cases examined, that chronic gastric ulcer conforms to the same type of calcium deficiency. Further, such cases are undoubtedly improved by the administration of parathyroid substance, so that there are indications that two chronic ulcerative conditions, differing widely in locality and in the symptoms they produce, may yet have a common biochemical relationship.

Wenniger[3] expatiates on the social importance of the **Zinc-glue Bandage** for leg ulcer which allows the patient to be up and about, and the old rebellious ulcer heals promptly under its influence. After cleaning with benzene, he covers the ulcer with a disc of rubber tissue or oiled silk, and then smears the leg from toes to knee with the glue, liquefied by heating. The formula is: 450 c.c. distilled water; 200 c.c. white gelatin; 200 c.c. glycerin; and 150 c.c. zinc oxide. When the entire leg is smeared thick with this, a 10-cm.-wide gauze bandage is wound from toes to knee. Cotton is then placed over the ulcer and an outer bandage applied. It is left untouched for from one to four weeks, and is then cut off and a new one applied after the benzene cleaning, powdering, and, if there is much eczema, salving with **Lassar's Zinc and Starch Paste.** Ulcers of years' standing heal under this in a few weeks or months, and years may elapse before there is recurrence, if ever.

C. A. Robinson[4] describes 20 cases of ulcer of the leg treated by **Electrical Methods.** The ulcers in the cases reviewed were what would be called varicose ulcers without the presence of varicose veins. In many of the cases scarring had deprived the ulcer of a proper vascular supply. The first indication in such cases is to increase the blood flow through the tissues by relieving the stasis and rendering the scar tissue more vascular. In the cases reported the direct current was used, the cathode being applied to the ulcer. By its action in rendering the secretion more fluid, the crusts and scabs are removed and a free discharge of pus is induced; probably also the capillaries are dilated

# *PLATE XXXVIII.*

## THE CARREL METHOD OF VESSEL SUTURE

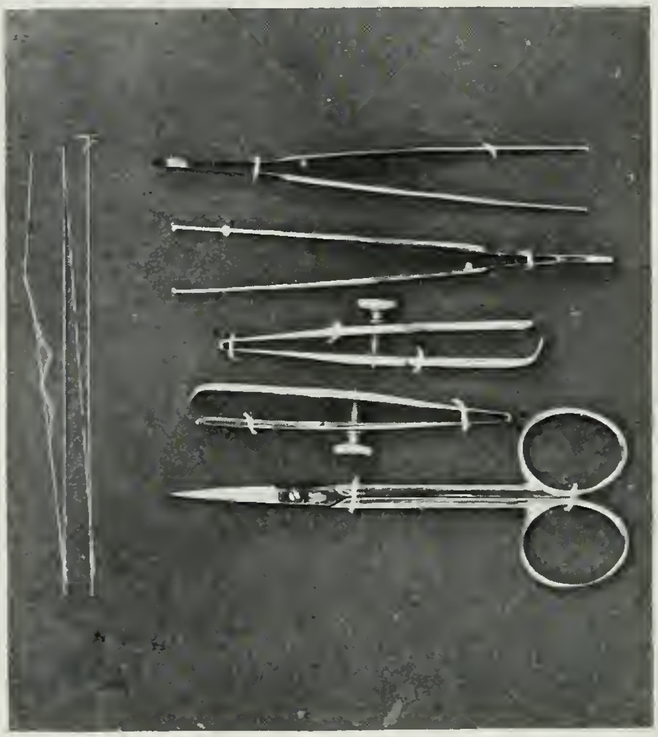


*Fig. A.*—The instruments used in suture of the vessels.

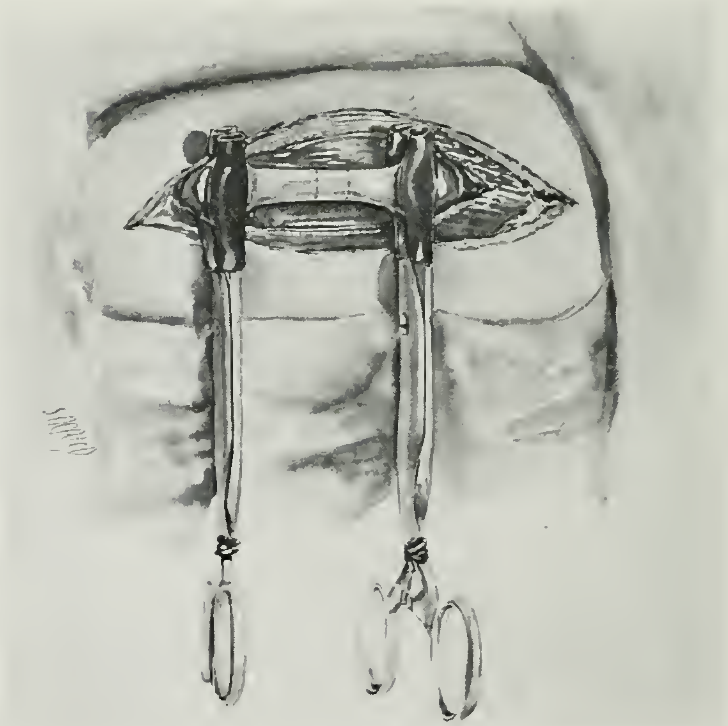


*Fig. B.*—An ordinary hæmostat which may be made to take the place of the Crile clamp.

*By kind permission of ' Surgery, Gynecology, and Obstetrics '* or contracted, diapedesis is modified, the amœboid movements of leucocytes are hastened, and phagocytosis is increased.

In applying the current the legs were placed in Schnee cells connected with a direct current supply, the leg with the ulcer being placed in the cell attached to the negative pole. A current of 30 ma. was employed for thirty minutes. A large part of the current passes through the ulcer because of its lessened resistance, but enough traverses the skin to cause a general hyperæmia.

Of the 20 cases, 4 were definitely cured within two to eight weeks. Five are healing rapidly or were doing so when they were transferred to other institutions. In 4 cases the treatment failed. In the remainder the results were inconclusive, as some had been under treatment only a few days, one developed an epithelioma necessitating amputation, and one patient was syphilitic. If only cures and failures are considered, 50 per cent were cured. All the cases were chronic and had been under other treatment for years.

References.—[1]*Beitr. z. klin. Chir.* 1921, cxxiv, 1 (abstr. in *Jour. Amer. Med. Assoc.* 1922, Jan. 21, 253); [2]*Brit. Med. Jour.* 1921, ii, 687; [3]*Jour. Amer. Med. Assoc.* 1922, Feb. 25, 625; [4]*Arch. of Radiol. and Electrotherap.* 1922, xxvi, 253 (abstr. in *Surg. Gynecol. and Obst.* 1922, May, 392).

## VASCULAR SURGERY. (*See also* Aneurysm.)

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

*Suture of Blood-vessels.*—The field for suturing blood-vessels has been greatly reduced since the early development of this branch of surgery. For example: It is safe to ligature an artery and vein above and below an arteriovenous aneurysm with removal of the sac. The patient is usually young and healthy, and collateral circulation has developed. Again, if a tumour is attached to a large artery, the vessel may be ligated with safety, because the slow obliteration of the vessel by pressure of the tumour has already established collateral circulation. There are, however, instances in which suture of a large blood-vessel is preferable to any other treatment. In patients over 40, end-to-end suture, if possible, is preferable to ligation. Collateral circulation becomes more and more doubtful as age advances.

Horsley[1] reports a case of suture of the brachial artery in front of the elbow, in a man of 37. The ends of the vessel were trimmed off with scissors, and the elbow was flexed to relieve tension. The double mattress stitch with very fine silk was employed in such a way as to evert the margins and bring broad endothelial surfaces together. The patient left the table with a pulse of 90 and of good volume; he was examined a year afterwards, and the pulsation at the site of the sutured artery was distinct.

J. M. Neff[2] describes the Carrel method of vessel suture. The special instruments necessary (*Plate XXXVIII*) are the following: Three or four very fine straight sewing needles; very fine silk; two Crile's screw clamps, or ordinary hæmostats arranged with rubber tubes over the blades and narrow rubber bands wound round the shafts near the finger rings to keep the blades in apposition; fine-toothed tissue forceps; sharp straight manicure scissors; and sterilized vaseline with which to coat the needles and thread.

After trimming, the open arterial ends are apposed by two or three interrupted sutures, passing completely through the lumen of each segment. These traction sutures are held by forceps and facilitate the introduction of a continuous suture of the same fine silk. The sutures are introduced as closely to the edge as possible, and as near together as is necessary to secure perfect approximation (*Fig.* 43). After suture, when the clamps are removed, there is usually some bleeding through the stitch holes, but this stops after a few minutes.

It appears from the literature, and from the experience of most surgeons, that the operation of end-to-end suture is more indicated in the common carotid than in any other artery in man. Ligature of the common carotid during the war and in civil surgery has proved to be an operation attended with a good many untoward results; where end-to-end suture is practically possible, it should be preferred to occlusion of this vessel.

Sloan[3] says that suture of the common carotid artery appears to be one of the rarest of operations. He was only able to find 8 cases recorded, each occasioned by an aneurysm.

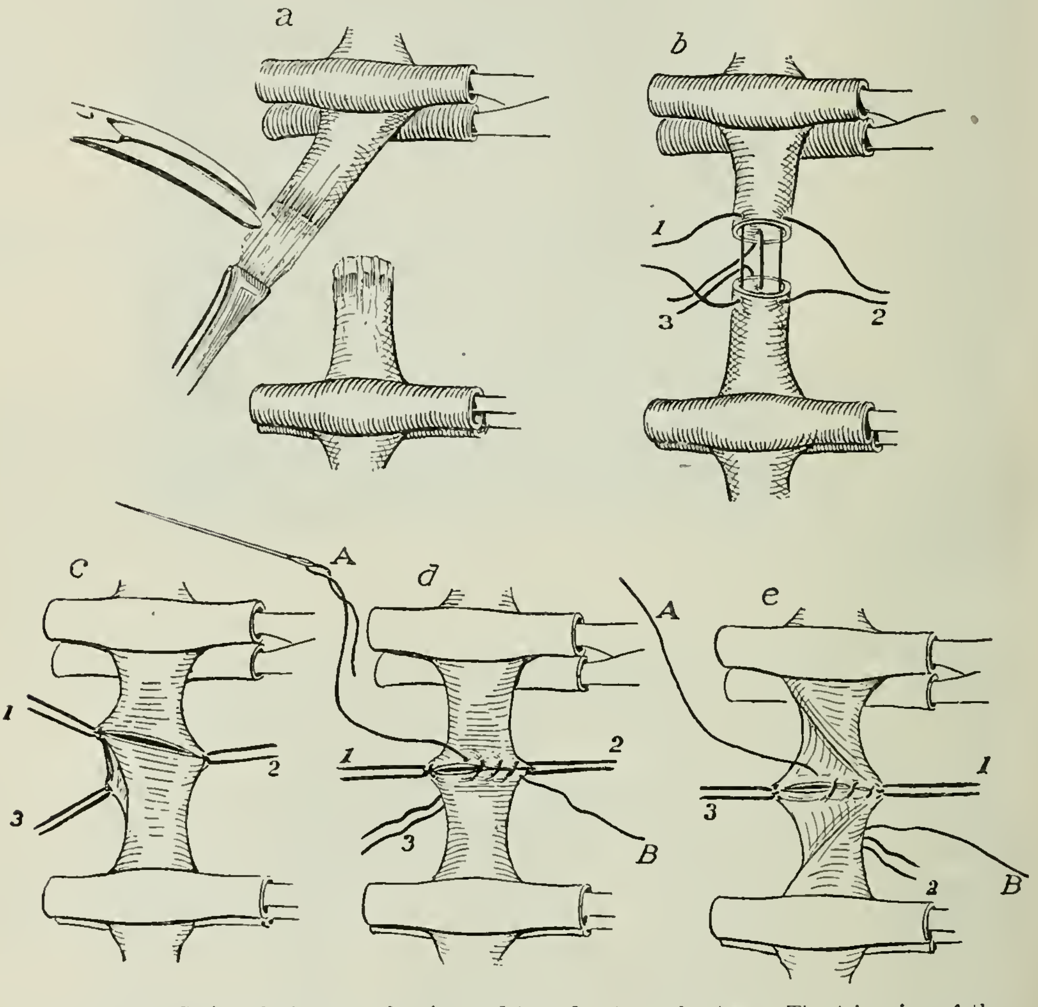


*Fig.* 43.—Series of diagrams showing end-to-end suture of artery. The trimming of the ends, the traction sutures, and the introduction of a continuous suture, are shown. (*a*) The clamps are in place on the vessel, and the adventitia is being drawn over the end of the vessel, about to be cut off by the scissors. (*b*) The three guy rope sutures, equidistant from each other, are in place, having been passed through all coats of the vessel. 1, 2, and 3, Guy ropes. (*c*) Guy ropes 1, 2, and 3 are tied, traction is being made on them, and the circumference of the artery is converted into a triangle. (*d*) The continuous silk suture has been started at 2, and is uniting the edges, passing through all the coats. (*e*) Traction is now being made on guy ropes 1 and 2, twisting the vessel through one-third of its circumference. The same continuous suture, B, is shown passing through all coats of the vessel.

[The reviewer had the privilege of seeing Dr. Sloan perform the operation of end-to-end suture of the carotid on a man, age 66, the details of which are published in the paper under review. The block dissection for the removal of malignant glands of the neck was being carried out when the common carotid artery was accidentally wounded. The vessel was caught in a forceps which cut through the sclerosed vessel walls. Having regard to the age of the patient, and realizing that the older the patient the greater the danger of ligation of the common carotid artery, Sloan decided to excise the damaged area of the vessel and make an end-to-end anastomosis. The patient's head was raised to relieve tension; Carrel's method, as described above, was employed. Difficulty was found owing to sclerosis of the vessel's wall and the consequent loss of elasticity. On completion of the operation the temporal pulse could be distinctly felt. On the second day the pulsation in the right temporal artery was about half the volume of that of the opposite side, but on the third day both sides were of equal volume, and have so continued ever since. There were no nervous symptoms following operation, nor was there any change in mentality.—W. I. de C. W.]

**Sympathectomy.**—Leriche[1] publishes some researches on the periarterial sympathetics. He states that, when the sheath of an artery, e.g. the brachial artery, is pinched, the vessel contracts, its pulsation stops at once, and its size diminishes. The contraction usually causes the pulse to disappear, but does not altogether interrupt the circulation. He deals with the physiology, pathology, and therapeutics, and explains how removal of the sympathetic nervous plexus included in the external layer of blood-vessels affects various pathological conditions. In painful phenomena, sympathectomy is often efficacious. Of 9 cases suffering from causalgia, excellent results followed the operation in 5. Twice the operation gave a good result in Raynaud's disease. Hypertonic muscular contractures are influenced by sympathectomy. In trophic troubles leading to ulcers, sympathectomy did well. Twelve cases out of 13 were followed by rapid healing; but relapse is possible if the cause of the trophic trouble has not been removed. In cases of trophic symptoms after nerve sections, results were excellent. He thinks that local circulatory hyperactivity noted always after sympathectomy in the following hours accounts for the good results, vasodilatation being apparently one of the most active causes in the tissues' growth. Vasodilatation, and local elevation of pressure and of temperature, favour healing. He has proved experimentally, on rabbits, that ulcers heal more rapidly in an area supplied by an artery deprived of the sympathetic plexus.

**Thrombosis of Abdominal Aorta.**—Hesse[5] summarizes 73 cases of thrombosis and embolism of the abdominal aorta on record. Nearly 95 per cent died under expectant treatment, but in 10 cases an attempt was made to remove the obstruction. It was successful in 50 per cent, and in some of the others came too late, as the limb was already dead. Embolism of the aorta is more common than thrombosis. It is usually secondary to endocarditis, principally mitral stenosis. The symptoms are in the legs at first, as the circulation is shut off. If there is no pain in the abdomen, and there are no bladder symptoms, the embolus is probably at the bifurcation. In over half the cases the embolus projected into the iliac artery. Transperitoneal aortotomy with extraction of the embolus is advisable in recent cases; but with thrombosis, high amputation of the thigh is the only resort; ligation of the vein cannot be recommended. If the blood-stream becomes obstructed again after the embolus has been removed, he advocates high amputation of both thighs.

**Thrombosis of Inferior Vena Cava.**—Kerr[6] states that this condition may follow an infection, such as typhoid fever or puerperal sepsis; traumatism; or malignant tumour of the kidneys, suprarenal bodies, or liver. The prognosis, apart from malignant cases, is obscure. Patients may survive a considerable number of years; one case is mentioned which lived for twenty-five years after an attack. Kerr gives the notes of the case of a patient who developed thrombosis of the inferior vena cava fifteen years previously from puerperal sepsis. She developed œdema of both legs, varicose veins, and hæmorrhoids. The superficial veins in the front of the abdomen became greatly extended to the level of her waist. Fourteen years later she had masses of varicose veins in both legs, varicose veins in the vulva, hæmorrhoids of a severe degree, and well-marked communication on each side between the tortuous veins behind the anterior superior spine and those of the lower intercostal spaces.

As regards the duration of life after thrombosis of the vena cava, it is interesting to look at the results of a series of experiments on dogs conducted by Béjan and Cohn. In the dog the inferior vena cava system is absolutely comparable with that of man, and ligature of that vein was performed by these investigators at different points. They reached the following conclusions: In ligature of the inferior vena cava below the level of the renal veins, whatever the points of application of the ligature, life is possible and compatible with ordinary good health. Ligation at the level of the renal veins, and comprising one of these veins in the ligature, is well tolerated. Ligature performed immediately above the renal veins, and taking in the left suprarenal body and its vessels, is also compatible with life, the circulation becoming re-established; but ligature performed above the right suprarenal body and its vessels is always followed by death, the circulation apparently remaining completely obstructed.

It seems evident, therefore, says Kerr, that complete obstruction of the inferior vena cava leads to the development of varicose veins, sometimes of very considerable extent, and to attacks in them of thrombophlebitis—in addition to pigmentation of the legs, varicose ulcers, and other sequelæ of severe varicosity—and to other symptoms of backward pressure in the venous system of the lower part of the trunk and the legs, but is not incompatible with a prolonged and fairly comfortable life.

References.—[1]*Jour. Amer. Med. Assoc.* 1921, July 9, 117; [2]*Surg. Gynecol. and Obst.* 1921, Dec., 657; [3]*Ibid.* July, 62; [4]*Ann. of Surg.* 1921, Oct., 385; [5]*Jour. Amer. Med. Assoc.* 1921, Aug. 13, 581; [6]*Brit. Med. Jour.* 1921. ii, 1112.

## VISCEROPTOSIS. (*See* Intestines, Surgery of.)

## VITAMINS AND THEIR USES: PUBLIC HEALTH ASPECT.

*Joseph Priestley, B.A., M.D., D.P.H.*

In no sense has the last been heard of the fascinating, but little understood (at present) subject of vitamins or accessory food factors. It may well be asked, "What are they?" The question is easy, the answer extremely difficult. The chemical constitution of a vitamin is unknown. As far as we have gone at present, there are stated to be three kinds of vitamins, viz.: (1) Vitamin A—fat-soluble, antirachitic; (2) Vitamin B—water-soluble, anti-beri-beric; (3) Vitamin C—water-soluble, antiscorbutic.

As examples, may be given the following: (1) Vitamin A—butter fat, cod-liver oil, dripping, and margarine made from dripping (except lard); (2) Vitamin B—seeds (unmilled) of cereals and other plants, yeast (autolysed or in extract), eggs; (3) Vitamin C—fresh green grasses and vegetables and fruits and fruit juices (especially orange and lemon juices and swede or turnip and tomato juices).

Lard contains no active vitamins, owing to the method of its preparation, being exposed to the air in shallow pans. In this way the vitamin is oxidized and, consequently, destroyed or rendered inert. The same applies to certain forms of cod-liver oil, the vitamin of which is destroyed or rendered inert in process of manufacture or preparation for the market, unless great care is taken. Indeed, the great drawback to vitamins is their unstableness, and the readiness and ease with which they are destroyed by heat, the addition of alkalis, drying, tinning or canning, oxidation, decomposition, etc.

Vitamins are constituents of food, but exist therein in very small quantities—the minutest quantities. A diet that is vitamin-free is a diet that may give rise to deficiency diseases and death. Rickets, pellagra, scurvy, beri-beri, xerophthalmia or keratomalacia, osteomalacia, etc., are well-known instances of deficiency diseases. Natural green foods are very rich in vitamins, as are natural fruits, and it is from such natural green foods and fruits that nursing mothers (and animals) obtain the vitamin-rich mothers' milk that is so essential for infants and young animals. Vitamins are produced only in plants, from which they pass directly in the form of vegetable diet, or indirectly in the form of meat (including poultry or fish) diet, into human beings. The milk of a nursing mother can be kept well stocked with vitamins (all forms, A, B, and C) by suitably feeding her. Milk, butter, and cream will secure the A vitamin, eggs and yeast the B vitamin, and fresh vegetables and fruits the C vitamin—in addition, of course, to the usual meat diet which supplies in minute quantities all three forms.

It is clear that medical officers attached to Welfare Centres should know all that is known about vitamins, so as to apply that knowledge practically to the patients who come before them for consultation purposes. New food preparations (vitamin foods) are coming on the market, containing the necessary vitamins in the form of wheat germ extracts, fats, egg yolks, and fresh fruit juices, and free from all drugs and chemicals. The value of such vitamin food preparations for infants and children and mothers (nursing and expectant) must be apparent to all.

## VON RECKLINGHAUSEN'S DISEASE. *E. Graham Little, M.D., F.R.C.P.*

Levin,[1] in this paper, attempts to elucidate associations of von Recklinghausen's disease with disorders of the endocrine function. He notes that, in many cases of the disease, symptoms have closely simulated those of Addison's disease, with presumably damage to the suprarenal. The development of the symptoms round about puberty, and the influence of pregnancy and the menopause, suggest that sex glands play a part. Partial acromegaly has been reported in some cases associated with von Recklinghausen's disease, so that the pituitary may also be a factor. Myxœdema and cretinism have also been seen in this association, thus invoking thyroid insufficiency. The discussion assumes more authority when the author is able to point to fifteen post-mortems of von Recklinghausen's disease, in which in a considerable majority of the cases changes were found in the suprarenals, and in several cases in the pituitary and thyroid. Endocrine therapy, which curiously enough has been very little employed in the disease, would seem to have a large field of usefulness.

REFERENCE.—[1]*Arch. of Dermatol. and Syph.* 1921, Sept., 303.

## WHOOPING-COUGH. *J. D. Rolleston, M.D.*

SYMPTOMS.—The occurrence of whooping-cough in the adult is discussed by several German writers, who point out that adults suffering from pertussis are responsible for the spread of the disease to a much greater extent than has hitherto been supposed, owing to the failure to recognize the nature of the complaint.

Neurath,[1] whose child had been infected by its nurse at the age of five months, maintains that whooping-cough is a distinctly milder disease in adults than in children.

G. Bourne and J. M. Scott[2] report a case of whooping-cough in an infant, age 21 months, with a leucocytosis of 176,000. Although the white cell count subsequently fell, no clinical improvement was obvious until the twenty-eighth day of disease.

Diagnosis.—L. Modigliani and S. De Villa[3] have employed an intradermoreaction similar to the Mantoux reaction for tuberculosis by means of an autolysat of the Bordet-Gengou bacillus. The reaction was positive, not only at the height of the disease, but also in children who had been exposed to infection before they developed definite symptoms. It was completely negative or very faint after the disease had lasted over two months.

A. H. Meyer[4] describes a diagnostic method which has been used at the State Serum Institute at Copenhagen for the last five years. The suspected patient is instructed to cough over an aluminium box containing a medium composed of potato-blood-agar. The box is then placed in an incubator, and in positive cases colonies of the Bordet-Gengou bacillus will be found in two or three days.

Treatment.—Many more papers have appeared on the treatment of whooping-cough by **Intramuscular Injections of Ether** since our last issue (*see* Medical Annual, 1922, p. 498), but the observers are by no means unanimous as to the success of the method. Veronesi,[5] who employed it in ten cases, while admitting that the injections help to diminish the gravity of the disease, maintains that the method does not constitute a great advance in the treatment of pertussis.

[The reviewer, who has recommended its application in a small number of cases, found that it was most likely to be effective if used at an early stage of the disease.—J. D. R.]

For the last eight years L. Dumont[6] has treated his whooping-cough patients by administration of 1–1000 **Adrenalin** solution in the following doses: below 3 years of age, 2 drops three times a day; from 3 to 7, 3 drops every three hours; from 7 to 15, 4 drops; and above 15, 5 drops. If no improvement occurs in three days' time, the dose is increased by 1 drop daily. The drops should be taken immediately after a paroxysm to prevent their being vomited. Dumont maintains that an attack of whooping-cough so treated should not last longer than two to three weeks.

R. Halphen[7] has successfully treated several cases by producing **Anæsthesia of the Superior Laryngeal Nerve,** irritation of which he regards as the chief cause of the paroxysmal cough. From 2 to 3 c.c. of 90 per cent alcohol are injected into the nerve on either side. In some children a single injection is sufficient, in others two may be required, and in a few instances the method is unsuccessful in spite of several injections.

By irradiation of the back and front of the trunk with a **Carbon Arc Lamp** from fifteen to sixty minutes daily, O. Meyer-Housselle[8] was able to effect a cure in most cases in one to two weeks, and in more obstinate cases in four weeks. He regards the treatment as specially suitable for hypersensitive children in whom painting the throat with silver nitrate is inadvisable. (*See* Medical Annual, 1922, p. 498.)

**Vaccination with Calf Lymph,** which since Jenner's time has been recommended as a remedy for whooping-cough, has recently been employed with success by Hammes.[9] F. Reiche,[10] however, failed to find that vaccination had any effect on the number and severity of the attacks or on the course and mortality of the disease.

References.—[1]*Med. Science*, 1922, vi, 3; [2]*Brit. Med. Jour.* 1922, i, 387; [3]*Med. Science*, 1922, vi, 5; [4]*Ibid.*; [5]*Ibid.* 6; [6]*Bull. Soc. de Thér.* 1921, 186; [7]*Rev. de Laryngol. d'Otol. et de Rhinol.* 1921, 643; [8]*Deut. med. Woch.* 1921, 996; [9]*Ibid.* 928; [10]*Med. Klinik.* 1922, 1052.

## XANTHOMA TUBEROSUM MULTIPLEX IN CHILDHOOD.

*E. Graham Little, M.D., F.R.C.P.*

Knowles and Fisher[1] report a remarkable case of xanthoma tumours in a boy of 10. The first nodules came in the site of a vaccination scar, and new ones came later on the buttocks, ankles, and elbows. They were of an orange-yellow colour, and varied in size from a pea to a walnut. One of these tumours was excised, and sections showed characteristic xanthoma and giant cells surrounding the capillaries. The child had in addition a mass in the abdomen without pain or tenderness, and there was a systolic murmur.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1921, Nov. 12, 1557.

## X-RAY DIAGNOSIS. (*See also* Electrotherapeutics *and* Radiotherapy.)

*C. Thurstan Holland, Ch.M.*

### GASTRO-INTESTINAL TRACT.

**The Abdomen.**—Radiologists and practitioners will learn much which is of value by reading a paper entitled "The Value of Pathological and *X*-ray Examinations in Abdominal Surgery", by Sherren.[1] In this paper full credit is given by the operating surgeon to the radiologist for the diagnostic uses of *x* rays, and taken as a whole it is a very fair statement as to the value of radiography from the surgeon's standpoint. In its general scope it deals individually with the many different abdominal conditions in which *x* rays are of assistance, and in discussing each condition the value of radiography comes under criticism, and its limitations as well as its successes are detailed. In criticizing this paper it should be pointed out that a surgeon must of necessity be somewhat influenced by the radiologist or radiologists who work for him, and the limitations of any individual radiologist may have a considerable influence on the attitude he takes up towards radio-diagnosis, and also to the value he places upon the *x*-ray opinion. Furthermore, the surgeon should not enter upon the difficult question of *x*-ray technique, and in this paper some of the suggestions made as to the methods to be adopted for making *x*-ray examinations would hardly commend themselves to most radiologists.

**Stomach.**—*Ulcer.*—Carman[2] is always instructive in the diagnosis of stomach conditions, and he suggests a new *x*-ray sign which may be of service in certain cases of ulcerating gastric cancer. The sign is a fluoroscopic one, as manipulation under screen observation is always requisite to bring out the diagnostic point. In the type of ulcerating cancer with flat and overhanging margins the author considers this sign to be pathognomonic. The paper is illustrated by photographs, radiographs, and diagrams which explain the kind of cancer dealt with, and the manner in which he produces this special *x*-ray sign, for the description of which the paper should be referred to. Barclay,[3] discussing the *x*-ray diagnosis of gastric ulcer, strongly urges the necessity of screen examination plus routine plate-taking; he lays great stress upon the importance of the experience of the man who does the screen work, looking upon the plates as merely going to check the screen observations. He also describes the necessary apparatus, the routine technique, the question of serial radiography, and the direct and indirect signs of gastric ulcer. An important observation he makes, and one with which we are entirely in accord, is that states of hypertony, normality, atony, and gastroptosis are not the slightest guide to either gastric or duodenal ulcer. On the other hand, we do not agree with him in his statement that atony of the stomach is not necessarily a pathological state, and that it is often really a sign of disordered function; we consider *definite* atony as always pathological. This paper, like all of this author's, is full of suggestion as regards the *x*-ray examination of the stomach, and is a valuable contribution to our *x*-ray knowledge. In a further paper Carman[4] discusses the vexed question of benign and malignant gastric ulcers from the *x*-ray standpoint, and he quotes from a number of authorities. His chief objects are two: (1) To point out the methods by which a definite *x*-ray diagnosis of malignant ulcer can sometimes be made; and (2) To show that probably in most cases it is not possible, from *x*-ray findings alone, to say whether a demonstrated ulcer is malignant or simple.

*Syphilis of the Stomach.*—In a lecture at the Royal Society of Medicine, Monod[5] pointed out that nearly all the literature on this subject was to be found outside of British publications. He is of opinion that syphilis of the stomach is much more common than is usually considered, in this country, to be probable. We believe that this condition is not infrequently overlooked, as there are no special pathognomonic *x*-ray findings; it is certainly a possibility which should always be borne in mind, especially in those cases in which the *x*-ray appearances suggest malignant disease but in which the clinical aspect does not point to this condition. However, frequent or not, it is impossible to agree with Monod's idea that all hour-glass stomachs are highly suspicious of syphilis; our experience of a very large number of these cases, chiefly in women, is that neither from their history, nor from their behaviour following operation, is there anything to point to their syphilitic origin.

*Failures after Gastro-enterostomy.*—A short paper by Pirie,[6] entitled "Failure after Gastro-enterostomy turned to Success by the Knowledge furnished by X-ray Examination", is useful in pointing out the cause of the failure in certain cases, and the ease with which relief can be obtained. The writer, in discussing the question of the 'vicious cycle', so often stated to be the cause of failure, states that he has often looked for this on the fluorescent screen and has never seen it. We agree with him that what is actually found in nearly all the cases of recurrence of symptoms following a gastro-enterostomy is delay of a certain amount of food at the bottom of the stomach after the bulk of the food has passed out. Pirie considers this delay is, as a rule, due to the stoma being placed too far from the pyloric end, and by means of the *x*-ray examination he has been able to position the patient so that the last remains of food are evacuated. In one case the patient was instructed to lie on the left side, and immediately the residue began to pass out; in another case it was only when the patient rolled over on to her stomach, with the latter pressing upon a doubled blanket, that the remains of the food began to pass through. These simple measures, carried out regularly, entirely relieved both cases. Spriggs[7] has also made an *x*-ray study of the causes of failure after short-circuiting operations in a series of sixty-five cases in which relief was sought from recurred symptoms. Apart from the *x*-ray findings this is a comprehensive paper and emphasizes many important points. Numerous striking radiographs are used for illustrative purposes. The chief *x*-ray points made in these cases are: (1) That the stoma was not at the lowest part, and food remained in the area between the stoma and the pylorus; (2) That the jejunal loops were not normal in appearance; (3) Dilatation of the duodenum; (4) Evidence of ulceration in the neighbourhood of the stoma, or of active ulceration of the stomach or duodenum.

*Gastroptosis.*—Conran[8] has studied 'dropping of the stomach' in a series of 150 cases. This paper covers much ground, and, following a description of the *x*-ray technique, there is a careful analysis of all the cases; and the etiology, symptoms, and *x*-ray findings are all tabulated. Drawings of the whole series of cases, and a few radiographs, are included. [This paper, like many others on the same subject, confuses definite gastroptosis with conditions which may be, and probably are, quite normal. The mere fact that the lower border of the stomach after a test meal, and in the standing position, is so many centimetres below the level of the iliac crests, is no proof whatever that the case is one of a pathological 'dropped stomach'. In a study of the gastroptosis it has always seemed to me to be necessary to take into consideration the distance from the crest of the diaphragm to the crest of the ilium, a distance which may quite well be so small that a normal stomach after a meal, and in the upright position, must necessarily have its lower border far below the level of the iliac crests. Many of the drawings of the stomachs illustrating this paper are not, in my opinion, cases of gastroptosis.—C. T. H.]

*Hair-balls.*—The latest paper on this subject by Davies[9] gives a complete account of the papers on, and our knowledge of, this condition up to the present time, and the author adds two further cases, which bring up the number recorded to 108. Neither of these cases had been radiographed prior to operation. [It is evident that the difficulty of diagnosis in these cases—except the certain one by means of an *x*-ray examination—is due to the fact that it is seldom that more than one case is seen by any one individual. In the two cases which I have seen, no difficulty lay in the diagnosis of the second case without an *x*-ray examination; with the knowledge gained by the first case the cause of the tumour in the second was at once recognized.—C. T. H.]

**Duodenum.**—Roberts[10] publishes radiographs and a description of a case of extreme dilatation of the duodenum in a male, age 42 years. These cases are very rare, and it is of interest in this instance, in which the whole duodenum was of enormous size, that the *x*-ray appearances of the stomach were normal. The apparent cause of the dilatation was a crescentic band of cicatricial tissue at the duodenojejunal flexure; but in a similar case quoted, nothing was found to account for the dilatation.

*Hæmangioma of the Duodenum* is exceedingly rare, and the only case ever seen in the Mayo clinic is recorded by Carman.[11] The *x*-ray appearance was a ring, or cyst-like, deformity of the duodenal bulb; the radiograph is reproduced in this paper. One similar case was found recorded in the literature.

*Ulcer and Cancer of the Duodenum.*—In an extremely interesting paper, Crane[12] discusses two cases which he carefully studied from all points on the behaviour of the stomach in ulcer and cancer of the duodenum below the bulb. These cases are very rare, and in the two quoted there was a marked difference in the *x*-ray stomach between the one with ulcer and that with cancer. Crane asks if these differences hold good in all cases? That is, should prolonged gastric retention without signs of gastric, pyloric, or bulbar involvement arouse suspicion of cancer of the duodenum; and should rapid expulsion of the stomach contents without achylia and without bulbar changes arouse suspicion of ulcer of the duodenum below the bulb?

**Appendix.**—Ström's[13] article on the radiographic diagnosis of changes in the appendix and cæcum is one of the most comprehensive papers on the subject which have appeared up to the present, and it should be read. It is illustrated with a large number of radiographs, is historical, gives a detailed account of the technique, and discusses the normal and abnormal *x*-ray appendix. The author concludes that an *x*-ray examination is of great value in both normal and pathological conditions of the appendix, and he lays stress upon the form of the appendix, especially as regards stenoses, kinks, and adhesions. He disagrees with some radiologists, inasmuch as he does not consider the retention of test food in the appendix after the emptying of the cæcum as a reliable indication of a pathological condition. We would agree with the author as regards this to a certain extent; but the undue retention of food in the appendix day after day, and sometimes even after the whole meal has passed out of the bowel, we consider a potential danger; and in the absence of any other cause for the symptoms being found, we should be inclined to suggest the removal of such an appendix. Ström considers that it is possible to visualize about 90 per cent of appendices. This is quite a fair statement, and without laying undue stress upon those cases in which the appendix is not shown, it is possible that many of them are of the type already referred to which retain the barium food, and which may be full of other retained food at the time of the *x*-ray examination, and so do not allow the test food to pass in. In discussing technique, Ström does not agree that the much-vaunted barium and buttermilk meal has any particular advantage over other forms of barium suspension ; with this we are in entire agreement, and our experience is that an ordinary barium and bread-and-milk meal visualizes the appendix quite as often as any other form of the meal.

**Colon.**—A. F. Hurst's[14] address on "The Sins and Sorrows of the Colon" is instructive, and has much that is valuable from the *x*-ray point of view. He emphasizes the point that treatment of chronic constipation without an *x*-ray examination is an absurdity, as it is practically only by means of such an examination that the site and cause of constipation can be accurately determined. In his experience more than half the severe cases of constipation he has seen in the last fifteen years have been pure dyschezia, with the passage of the food through the bowel at a normal rate. He also points out that it is not necessarily pathological for the transverse colon to be looped into the pelvis, for the lower border of the stomach to be well below the umbilicus, or for the cæcum to drop into the pelvis in the upright position—facts often forgotten or overlooked in the reading of a set of test-meal radiographs.

Ramond and Borrien,[15] of Paris, have made a radiographic study of the splenic flexure, the highest part of the colon, from the point of view of its gas distention and the symptoms it gives rise to. A direct connection between aerophagy and this splenic-colon distention can be established, the swallowed air being passed on. This condition should be remembered in patients who complain of a persistent feeling of distention, tachycardia and palpitation, constipation, and dyspnœa on slight exertion. It should be noted that it often occurs in conjunction with gas-distention of the stomach, that it causes a rise in elevation of the left diaphragm with a considerable displacement of the heart, and that physical signs may possibly suggest a left-sided pneumothorax. The exact diagnosis is of course a purely *x*-ray one.

**Pneumoperitoneum.**—Case[16] sums up the present status of artificial pneumoperitoneum as a diagnostic aid in a review of his three years' work plus the various published papers. This paper is of importance, as, in addition to personal experience and papers published by others, the author has gathered information direct from over one hundred *x*-ray workers ; he deals with the subject from the points of view of inconveniences, dangers, deaths, and indications. Notwithstanding that it has been repeatedly asserted that the dangers are infinitesimal and that patients suffer little or no inconvenience, Case tells quite a different story. In discussing the question from the patient's point of view—a not altogether unimportant one—it is stated that the proceeding is not popular with the patients, and that no patient examined in this way recalls the experience as being a pleasant one. The actual dangers enumerated, and cases of which have occurred, are intestinal puncture, puncture of omental or mesenteric blood-vessels, puncture of abdominal viscera, peritonitis, air embolism, cardiac failure, and so on. Four deaths directly associated with pneumoperitoneum are recorded : one due to the introduction of oxygen into the spleen, one due to peritonitis, and two others (given in full detail) in which the exact cause of the death was not quite certain. It should be noted that one of these cases occurred in—to quote the paper—one of the best-known medical institutions in the world, where no question could be raised as to want of care or skill. Case considers pneumoperitoneum is definitely indicated in a selected class of cases of obscure abdominal or retroperitoneal conditions in which a correct diagnosis cannot be reached otherwise and is of importance, and in which an exploratory operation does not seem preferable; also that in certain gynæcological conditions it is sometimes of use. It is quite evident that he does not approve of this method of $x$-ray diagnosis in a very large number of the cases in which it has been used; neither is he impressed by any very extraordinary results obtained by it.

Regarding the use of the method in *gynæcological conditions* a paper by Peterson[17] is a fair statement of the position. This deals with the two methods, of the usual abdominal route, and that of passing gas through the uterus and tubes. This paper describes technique fully; but a consideration of the summary in which its diagnostic uses are stated does not impress the reader that any startling results in accurate diagnosis have followed its adoption. Benthin[18] also concludes that pneumoperitoneum is not of much diagnostic value in gynæcology, and that it is only in exceptional cases, in which the diagnosis between a genital tumour and a tumour of the mesentery or intestine is uncertain, that the method is advisable. In his opinion it is a proceeding decidedly unpleasant for the patient, dangerous in extensive abdominal adhesions, and practically inapplicable in the differential diagnosis of pelvic disease. This is one view; but Impey,[19] after a visit to America and spending three months investigating the work in the Gynæcological Department of the Michigan University Hospital, sees things in quite another light. This paper is illustrated, and cases are narrated. The chief conclusions arrived at are that all the pelvic organs can be shown, that any pathological changes in the organs can be clearly made out, that in a large number of cases in which the bimanual examination was unsatisfactory important information was obtained, that pregnancy can be diagnosed as early as the sixth week, and that the technique is simple and free from danger.

**Kidneys.**—Graves[20] discusses "Shadowless Renal Calculi", and states that a small percentage of renal calculi fail to cast shadows on an $x$-ray plate, but that probably 80 to 90 per cent of stones will show. In this paper the reasons for the varying density of stones is discussed, and it is asserted that the $x$-ray opacity of a calculus is determined not alone by its composition, but also by its thickness and structure. A case of a pure cystin calculus which failed to reveal itself in two $x$-ray examinations is reported, and it is considered that pure cystin calculi should be classified amongst the relatively invisible stones. In estimating the value of this paper a great many points must be taken into consideration. My own experience, extending over many years and over many thousands of cases, is that everything depends upon scrupulous care in technique—no detail is too small for attention, and no risks must be taken. Given this care, then it is almost impossible to miss showing on a plate or plates the shadow of any calculus except that of the pure urate or uric-acid stone. I have *never* yet had a stone removed by operation from a kidney or ureter which has not been shown on an $x$-ray plate. On a very few occasions a small stone containing oxalates has been passed after an $x$-ray examination which has been negative: this, probably, because at the time of the examination its shadow was superimposed upon the shadow of the bones of the sacro-iliac region. The small pure uric-acid stone not infrequently passed by patients cannot, and never will, be shown by $x$ rays; fortunately pure uric-acid stones of what may be termed surgical size are rare in the ureter and extremely rare in the kidney; by the time a stone has reached the size which is surgical, in almost all cases it is a mixed calculus and will throw a shadow. I have never myself had a case in which a pure uric-acid stone has been found in a kidney by operation after an *x*-ray examination, but it is possible that very rarely a fairly large stone of pure uric acid may be found in a kidney ; I have been shown one such stone which was removed by operation, and the *x*-ray plates taken beforehand were of the finest diagnostic quality and showed no stone shadow. On the other hand, many cases have been published from time to time by surgeons of the removal of stones which had not been shown by *x* rays—the inference being that they could not be shown ; from a careful study of most of these reported cases it appears to be certain that bad technique, or placing reliance on plates of inferior quality, and which are not 'diagnostic plates', is the cause of these so-called mistakes in the vast majority of the cases. No method can be infallible ; but, putting aside the pure uric-acid calculi, inability to show a stone shadow is as a rule a proof of poor *x*-ray work. In the one case of a cystin stone in a kidney which I have radiographed, the shadow was quite clearly shown. The difficulty in *x*-ray work does not lie in the direction of not being able to show the shadow of a stone ; if a stone is actually present and its shadow has been obtained upon a plate, then it would not be easy to take a plate 'with ordinary care' which would not repeat the shadow. The real difficulty lies in the correct interpretation of a shadow, or shadows, when they are obtained on plates.

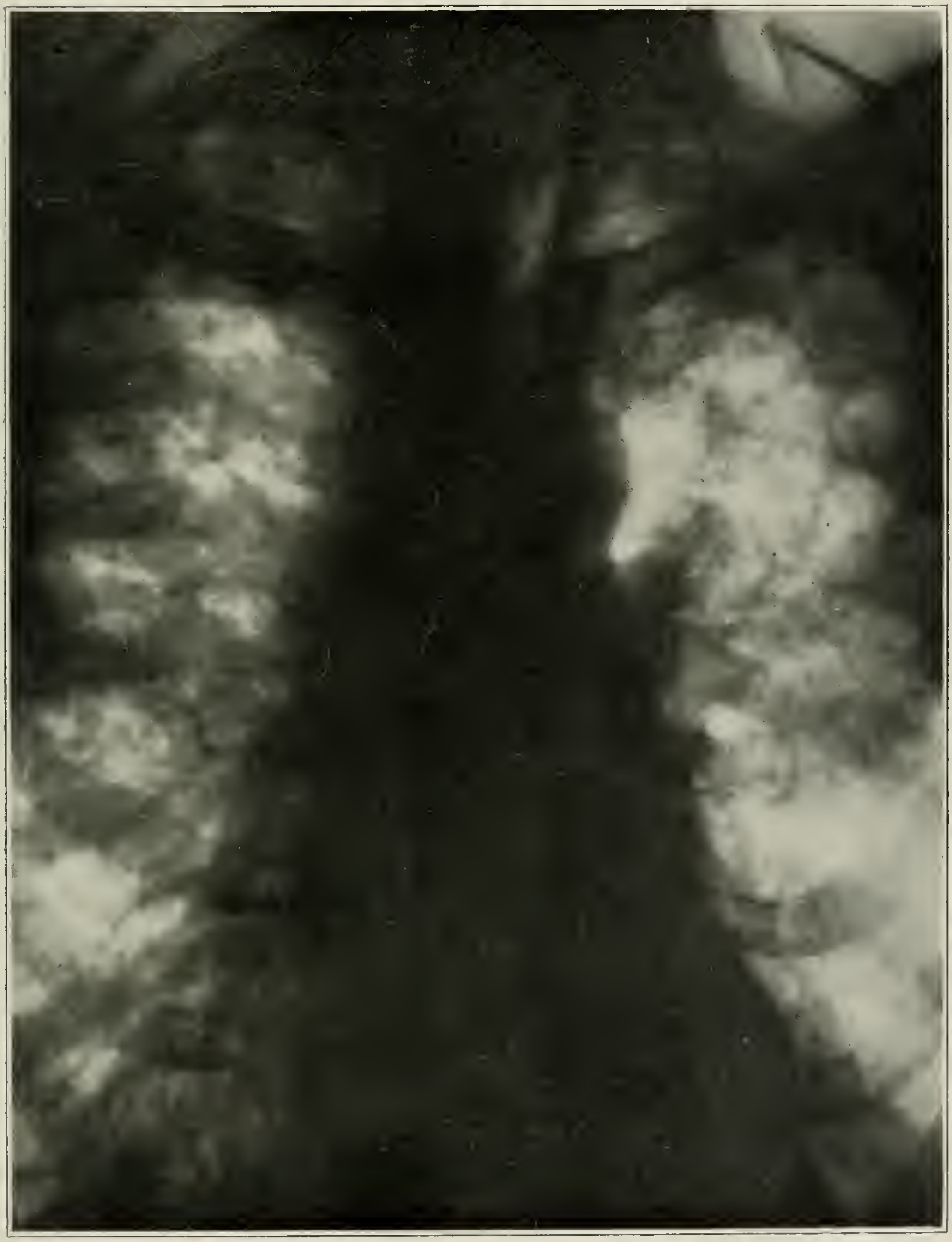
*The Carelli Method of Perirenal Inflation* is described by Hernaman-Johnson,[21] and a detailed account is given of the exact procedure of Dr. Carelli as seen by the writer. The essence of this method of examination is the injection of oxygen into the perinephritic areolar tissue—about 500 cm. is sufficient in most cases. There does not appear to be any undue discomfort to the patient, nor apparently any serious risk in this diagnostic method if it is carried out strictly on the lines laid down by Carelli and described in this paper. The resulting radiographs show the whole kidney surrounded by a translucent area, and the kidney outline is seen in its entirety. The method should be reserved for those few cases where the kidneys appear to be at fault in which the usual clinical and radiological examinations do not clear up the diagnosis ; it is possible also that it might be of some use in diseases of the adrenal body.

*Pyelography.*—A paper based upon three cases of pyelography by Morsow and White[22] very forcibly emphasizes the exact knowledge of the kidney condition which can be obtained by this method of examination in cases in which other methods have failed. In all these cases hydronephrosis was present, and the diagnosis remained in doubt until pyelograms had been taken. The cases are related in full detail, with good illustrations. In most general hospitals in this country this method is not used to anything like the extent it should be, probably owing to the fact that the technique has to be learnt, and the proceedings take a fair amount of time—an exploratory operation is a short cut. The authors give it as their considered opinion that, as a result of the introduction of cystoscopy, ureteral catheterization, and pyelography, no surgeon is justified in performing an exploratory operation upon the kidney. An accurate diagnosis can be made without visualizing the kidney by means of the knife. (*See also* KIDNEY, SURGERY OF.)

**Lungs.**—*Pulmonary Tuberculosis.*—In a long paper Dunham[23] considers the whole question of the *x*-ray diagnosis of this disease, based upon his experience of the examination of 10,000 cases, each checked by a careful physical examination and history, or by autopsy. This very important paper deserves the attention not only of radiologists but of all medical men interested in the diagnosis of pulmonary tubercle. Quoting the author : "This review of our

# *PLATE XXXIX.*

## GENERAL TUBERCULOSIS

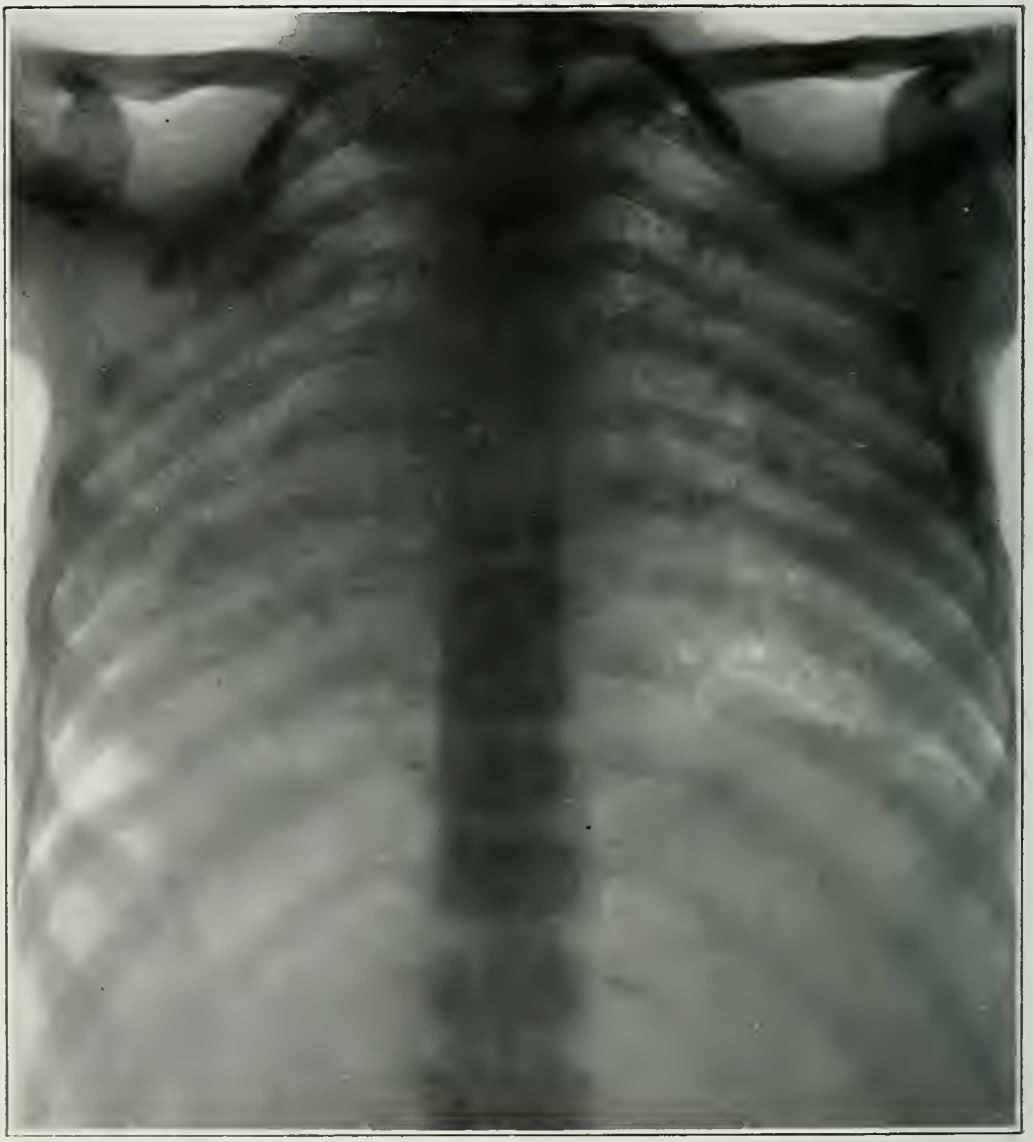


X-ray indication of general tuberculosis. No physical signs. Tuberculosis not suspected. Later bacilli found in sputum.

*C. Thurstan Holland.*

# PLATE XL.

## MILIARY TUBERCULOSIS

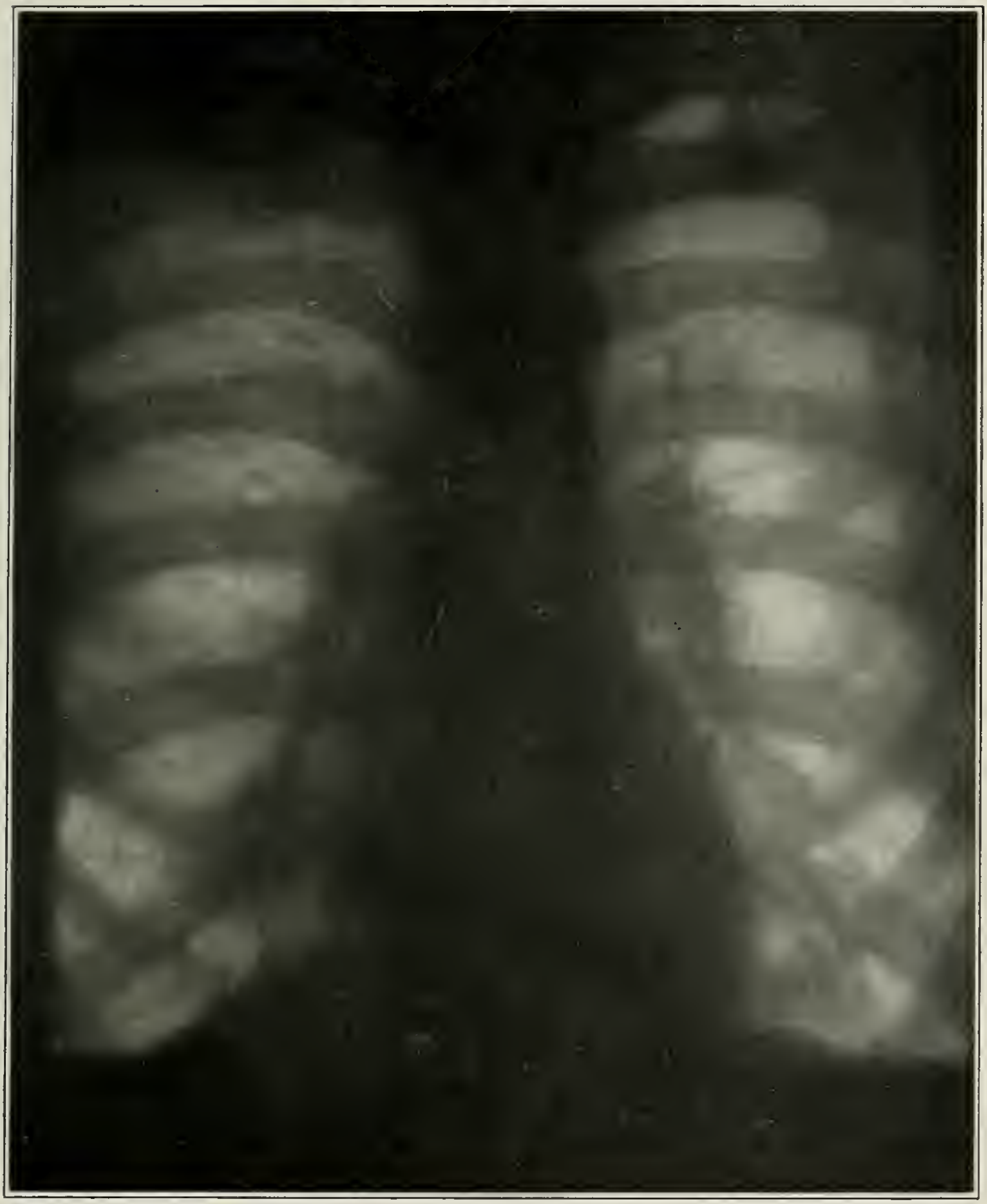


Child. No physical signs at time of *x*-ray examination.

*C. Thurstan Holland.*

# *PLATE XLI.*

## VERY EARLY TUBERCLE

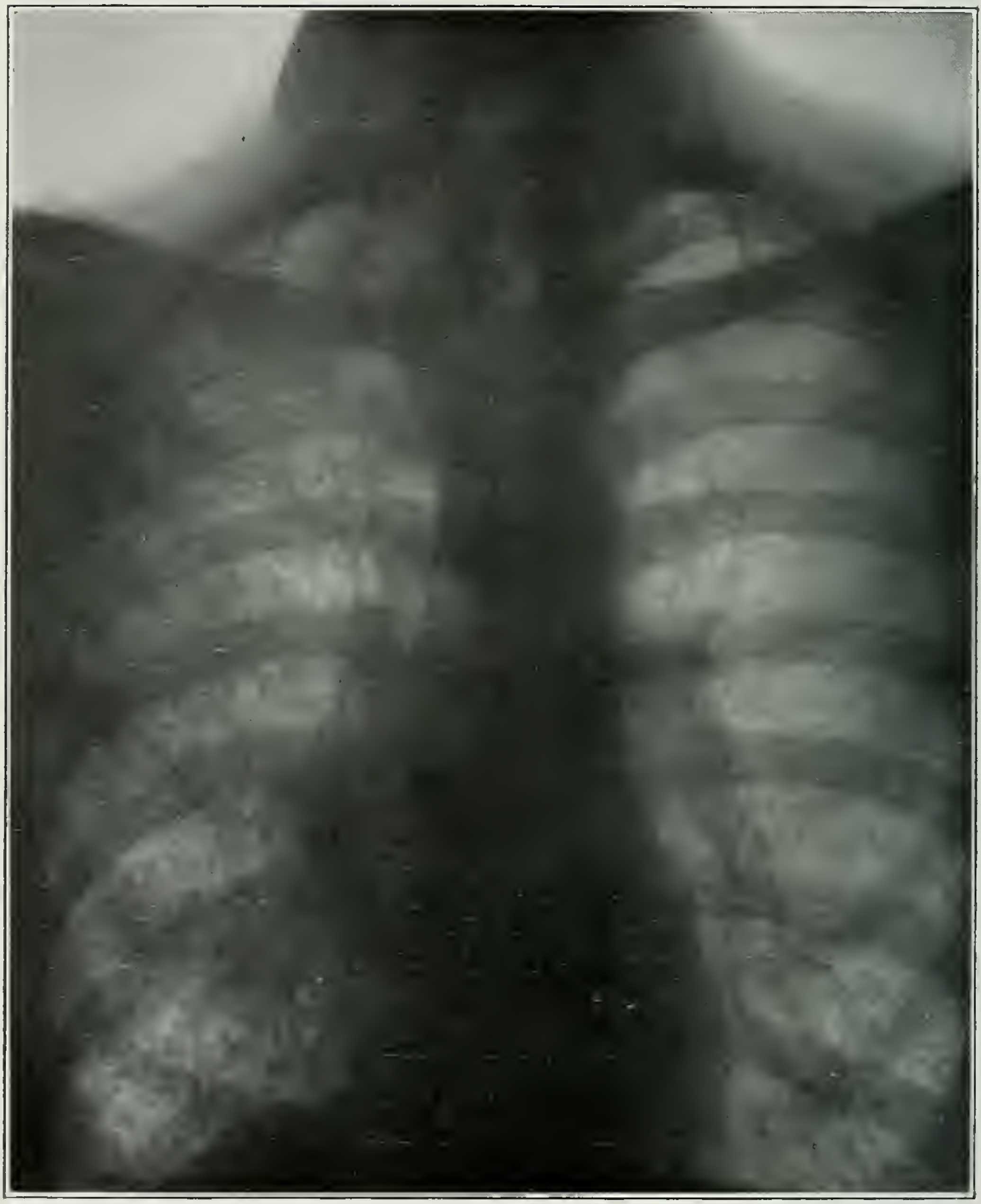


Adult male. Right root shadow exaggerated. Punctate shadows on bronchi extending towards apex. *X*-ray diagnosis, tubercle.

*C. Thurstan Holland.*

# *PLATE XLII.*

## GENERAL TUBERCULOSIS: RIGHT LUNG

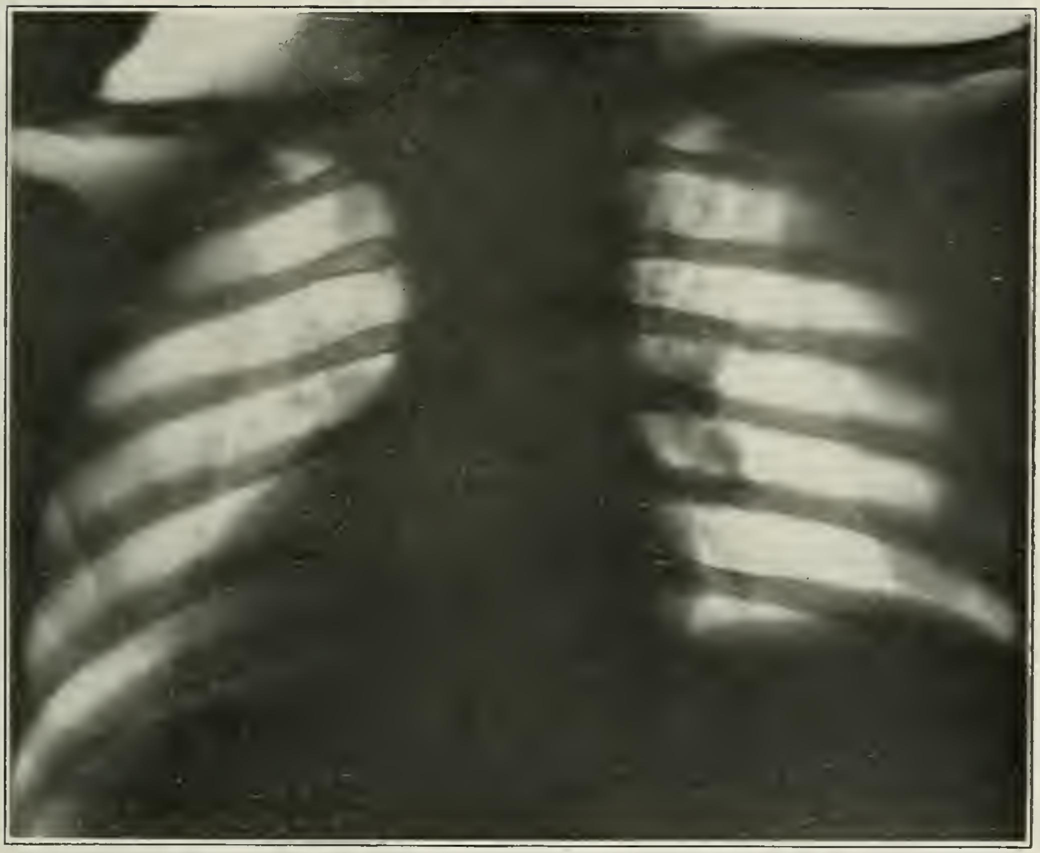


Same case as *Plate XLI*, eighteen months later.

*C. Thurstan Holland.*

# *PLATE XLIII.*

## HILUM TUBERCLE

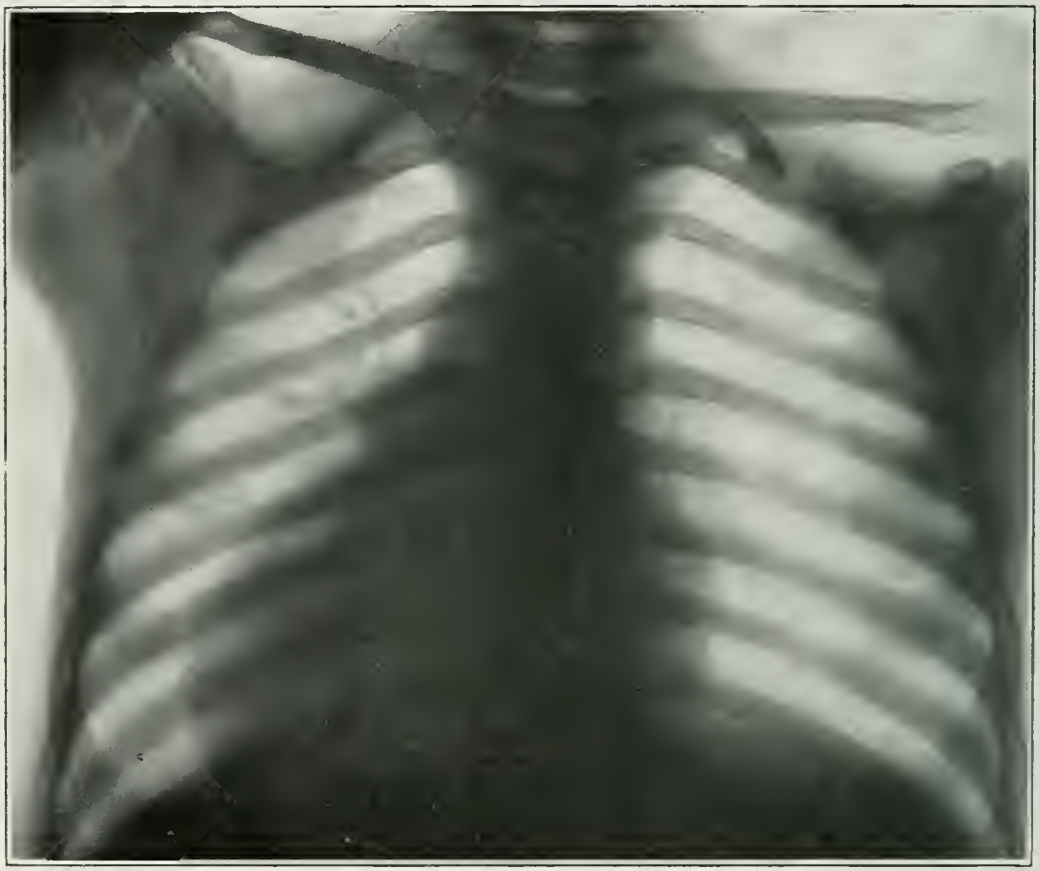


Child 11 years old. Infection of right root. Mottled shadowing along bronchi towards apex. Slighter shadowing along bronchi from left root.

*C. Thurstan Holland.*

# *PLATE XLIV.*

## EARLY HILUM TUBERCLE (PERIBRONCHIAL PHTHISIS)



Child, 6 years old. Punctate shadows along bronchi from left root.

*C. Thurstan Holland.*

10,000 chest examinations shows the need for more general use of the $x$ ray in studying the lungs. In tuberculosis clinics this examination should be routine, and if it were more used by our general hospitals it would not be long before many problems, such as syphilis of the lung, would be more fully understood. The greatest value of the routine $x$-ray examination lies in its ability to yield definite data *in the absence of physical signs.*" *Plate XXXIX* shows such a case. Repeated examinations gave no physical signs. Tuberculosis was not suspected. After an $x$-ray report and diagnosis of phthisis the patient was re-examined, and again no physical signs were found. The sputum was then examined and tubercle bacilli were discovered. *Plate XL* illustrates a case of miliary tuberculosis in a child. There were no physical signs at the time of $x$-ray examination. Later, bronchitic signs developed and the child died. *Plates XLI* and *XLII* demonstrate very well the value of the radiographic evidence. These are radiographs of the same case at an interval of eighteen months. When *Plate XLI* was taken, tubercle was suggested on account of the condition of the root shadow on the right side, and the fact that small punctate shadows extended from it along the bronchi, going towards the right apex. There had been slight hæmoptysis and a history of pleurisy. Eighteen months later *Plate XLII* shows the general mottled shadowing of the right lung so characteristic of tubercle.

Two papers by Stanley Melville[24] and by Herbert and Gouldesbrough,[25] both illustrated by radiographs, are of interest. This affection, as long as it remains a pure hilum tuberculosis, may be suspected clinically, but it can only be demonstrated certainly by radiographic examination. On the other hand, although it can be demonstrated radiographically, the $x$-ray findings in many cases cannot be determined as the result of active tubercle without the clinician. To quote one of the authors, the recognition of hilum tuberculosis in the adult and in the child is one of the developments which have taken place through the co-operation of the clinician and the radiologist. The typical $x$-ray appearances are described and illustrated in these two papers (*Plates XLIII* and *XLIV*).

*Syphilis of the Lungs.*—Golden[26] bases a paper on this comparatively rare condition upon three cases which he relates in full detail ; he also surveys the history and appends a short bibliography. The exact diagnosis cannot be made on the radiographic evidence alone. The author considers that the disease may develop pathologically in three ways : (1) Gummata with syphilitic peribronchial infiltration ; (2) Syphilitic peribronchial fibrosis ; (3) Bronchostenosis, with collapse of the lung from syphilitic ulceration of a bronchus.

*Non-opaque Foreign Bodies in the Air-Passages.*—A most important and profusely illustrated paper on this subject comes from Manges.[27] This is a continuation of his previous work (MEDICAL ANNUAL, 1921, p. 29), and is based upon a study of 56 cases. A careful analysis of these cases is given, and a brief analysis of the proved cases serves to show the constancy with which diagnostic $x$-ray evidence and localizing signs are present. This paper also discusses a few important points not mentioned in the first one, and the extreme care which must be used by the radiologist in coming to a conclusion which may decide the life or death of the patient. The technique is very carefully detailed.

**Heart.**—A paper by Martinez[28] describes the most recent advances made in France in the technique of the $x$-ray diagnosis of diseases of the heart and its vascular pedicle. The paper is very largely a description of the original work of Vaquez and Bordet, and of Thoyer Rozat. The work of these radiologists is of great interest, and those who cannot read the original French books and papers will find this paper useful as indicating the scope of this work, and also the new technique evolved for carrying it out. A further article on the $x$-ray examination of the heart, based upon the examination of about 100 cases, is by Karshner and Kennicott.[29] These authors do not use the French technique alone, but combine it with other methods which are described. A third paper on the same subject by Hirsch and Shapiro[30] deals with the morphology of the heart in relation to habitus, and a new method of estimating morphological changes. This paper is illustrated by radiographs of the different types of heart shadows, and diagrams showing how the standard measurements for the various types are arrived at. Lapage and Bythell[31] have studied the hypertonic and atonic hearts of children, and illustrations contrast the two types they distinguish by radiography. The main object of this paper is to establish the fact that the condition of hypertonic heart does occur in children.

**Bones.**—*Supernumerary Bones.*—Pirie[32] describes and illustrates several of the accessory bones of the wrist, six in all. These bones are very seldom seen, but are of importance in regard to the question of injury, and should be known. Amongst those shown are the os vesalianum of the fifth metacarpal which is exceedingly rare, the radiale externum, and the os centrale. The paper also deals with a few similar bones which occur in the foot, and amongst others the rare secondary os calcis is shown. The Vesalian bone of the foot is the subject of a paper by Baastrup.[33] This, which is in English, is illustrated, and references are made to many previously published papers on the same subject. This interesting bone is the subject of much controversy and of many different opinions, and the author discusses the question largely from the point of view of comparison with a fracture of the tuberosity of the fifth metatarsal bone.

*Dislocation of the Pisiform Bone.*—Cohen[34] has met with a case of this rare condition, and reports it with a radiograph. It occurred in a boy, age 11, who fell upon his left hand, and it was associated with a backward displacement of the lower epiphysis of the radius. The pisiform bone was higher up than is usual, and it could be moved up and down through a distance of half an inch.

*Congenital Synostosis of the Radius and Ulna.*—This condition is the subject of a good paper by Wakeley,[35] with some fine radiographs showing the varieties. It is one of the rarer congenital deformities of the forearm bones, but since the days of $x$ rays it has been found to be less uncommon than was formerly supposed. Eight cases form the basis of this paper, in which the etiology is fully considered.

*Fracture of the Ulnar Styloid.*—The same author[36] discusses this interesting fracture, which as a single lesion is not common. This, together with practically all fractures of the carpal bones, is an $x$-ray diagnosis. Three cases are recorded and illustrated.

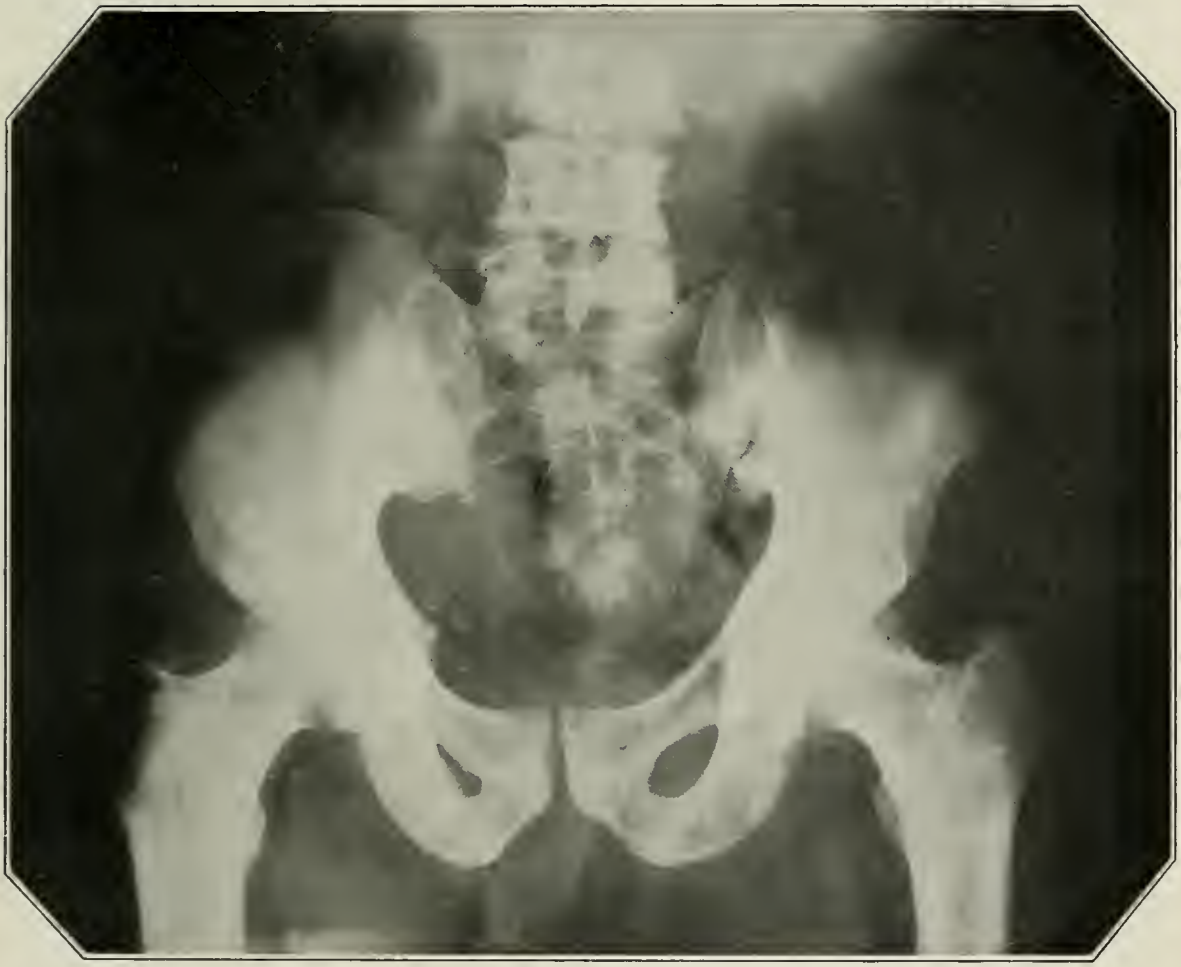
*Pseudo-coxalgia.*—Platt[37] publishes a masterly monograph on this condition of the hip-joint, which is of much importance from the radiographic standpoint, as it is only by this means that the positive differential diagnosis can be made. The history of the disease is recorded in this paper, plus a good bibliography. It is based on a selected series of 35 cases which the author divides into four groups, and is illustrated by numerous radiographs. Not the least interesting part from the $x$-ray point of view is the section entitled pseudo-coxalgia in adult life ; this, and the radiographs illustrating it, should be of assistance in the correct reading of many radiographs of adult hip-joints which may be somewhat obscure. Platt enters into much detail with respect to the $x$-ray appearances, and discusses the changes in their relation to the clinical manifestations, and also with regard to their significance.

*A New Disease of the Head of the Second Metatarsal* is described by Panner,[38] who has seen it in 13 cases. It is characterized by a shortening and flattening

# *PLATE XLV.*

## ADULT PELVIS

(Shown by the Potter-Bucky Diaphragm)



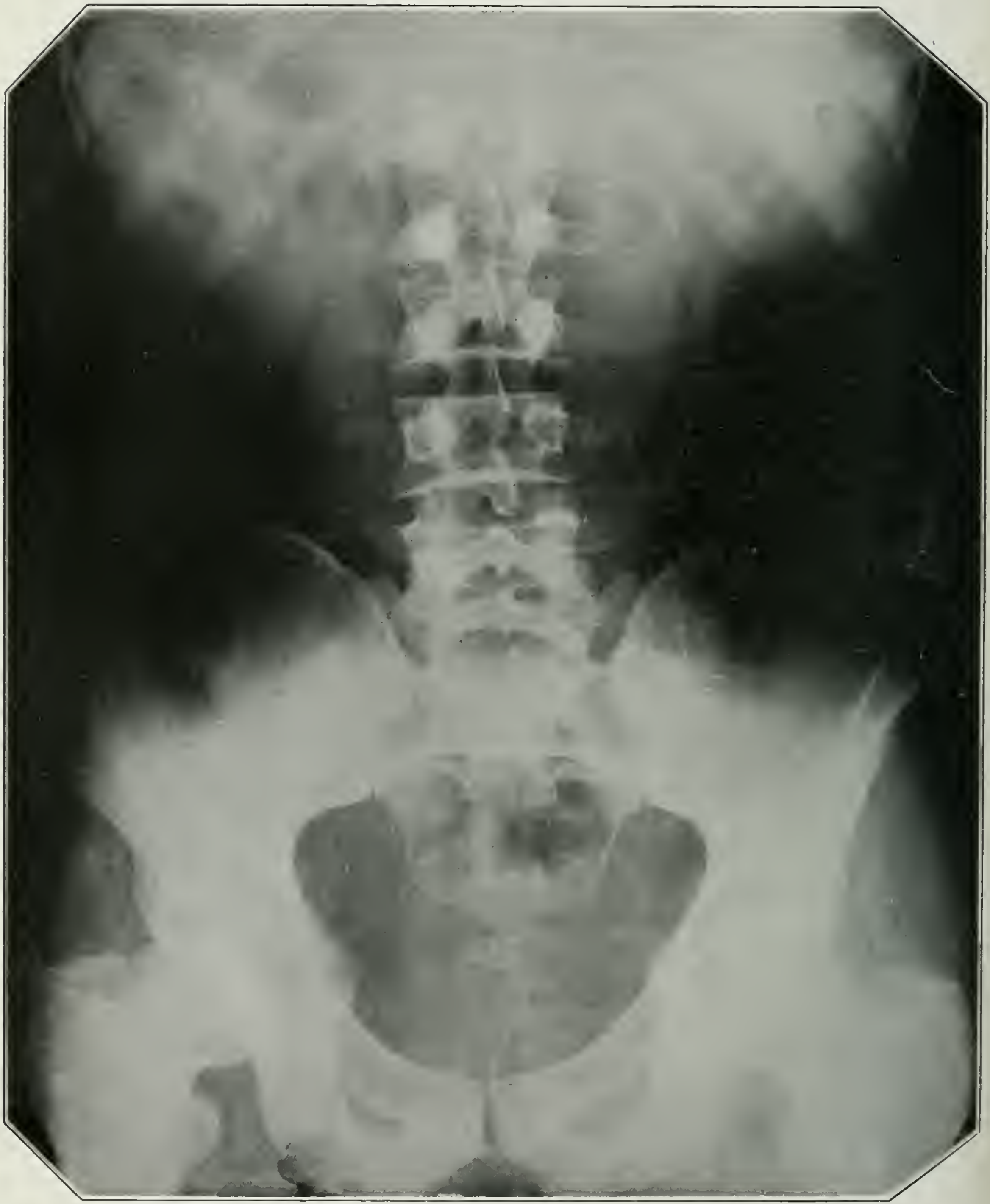
Adult pelvis.

*Arial W. George, Boston, U.S.A.*

# PLATE XLVI.

## SPINE AND PELVIS

(Shown by the Potter-Bucky Diaphragm)



Spine, pelvis, etc.

*Arial W. George, Boston, U.S.A.*

of the head of the bone, which also shows abnormally dark and light areas. Of the cases, 10 were in children and 3 in adults. Pain in the joint is the cardinal symptom, but the trouble runs a benign course and requires little treatment. The disease is not associated with either tubercle or syphilis, and the author regards it as allied to Legg's disease, Köhler's disease, etc.

*A hitherto unknown Affection of the Patella in Children* is described and illustrated by Sinding-Larsen.[39] Pain in the knee following a strain is the symptom, and it occurs in young children only. The radiograph, taken in profile, shows that the anterior or lower outline of the patella is hazy, and there is an abnormal deposit of opaque salts. The author considers it to be the result of periostitis or epiphysitis following the strain.

*Bone Changes in Hæmophilia.*—Klasow[40] enters fully into the bibliography in a paper, entitled "Hæmophilia and Hæmophilic Arthropathy", which is based on three cases. The characteristics of the *x*-ray picture are, in the early stages, a cloudiness of the capsule from blood-clots, and later on some decalcification, alteration of the cartilages, and deformities; the final stage shows the changes of a hypertrophic arthritis deformans.

**The Potter-Bucky Diaphragm.**—Last year (MEDICAL ANNUAL, 1922, p. 503) we referred to the value of this instrument for the purposes of obtaining detail and contrast in bone radiographs covering a large area. Increasing experience has confirmed the opinion then expressed of the importance of this instrument in diagnostic work. Further papers showing this, and the various uses to which it can be put, are by Abrams;[41] Dieffenbach and others,[42] in which an exposure table for various parts is set forth; and Towsey,[43] who enters largely into the physics. We are indebted to Dr. Arial W. George, of Boston, for the radiographs from which *Plates XLV* and *XLVI* are reproduced. These demonstrate very clearly the large amount of bone detail which can be obtained on large negatives—the originals measure 17 by 14 inches.

REFERENCES.—[1]*Lancet*, 1921, ii, 689; [2]*Jour. Amer. Med. Assoc.* 1921, 990; [3]*Lancet*, 1922, i, 219; [4]*Amer. Jour. Roentgenol.* 1921, 695; [5]*Brit. Med. Jour.* 1921, ii, 946; [6]*Amer. Jour. Roentgenol.* 1922, 358; [7]*Lancet*, 1922, i, 725; [8]*Quart. Jour. of Med.* 1922, 144; [9]*Lancet*, 1921, ii, 791; [10]*Archiv. of Radiol. and Electrotherap.* 1922, 237; [11]*Amer. Jour. Roentgenol.* 1921, 481; [12]*Ibid.* 1922, 102; [13]*Acta Radiologica*, 1921, 133; [14]*Brit. Med. Jour.* 1922, i, 941; [15]*Arch. der Mal. de l'Apparat. digest.*, Paris, 1921, ix, 313; [16]*Amer. Jour. Roentgenol.* 1921, 714; [17]*Surg. Gynæcol. and Obst.* 1921, 154; [18]*Centralb. f. Gynäkol.* 1921, Aug., *Brit. Med. Jour.* (Epit.), 1921, ii, 95; [19]*Edin. Med. Jour.* 1922, 21; [20]*Ann. of Surg.* 1922, 487; [21]*Brit. Med. Jour.* 1922, i, 91; [22]*Ibid.* 257; [23]*Amer. Jour. Roentgenol.* 1921, 427; [24]*Arch. of Radiol. and Electrotherap.* 1921, 178; [25]*Ibid.* 1922, 13; [26]*Amer. Jour. Roentgenol.* 1921, 502; [27]*Ibid.* 1922, 288; [28]*Ibid.* 1921, 491; [29]*Ibid.* 1922, 305; [30]*Amer. Jour. Med. Sci.* 1921, 892; [31]*Proc. Roy. Soc. Med.* (sect. Diseases of Children), 1922, 18; [32]*Amer. Jour. Roentgenol.* 1921, 549; [33]*Acta Radiologica*, 1922, 334; [34]*Ann. of Surg.* 1922, 238; [35]*Archiv. of Radiol. and Electrotherap.* 1921, 185; [36]*Ibid.* 150; [37]*Brit. Jour. Surg.* 1922, 366; [38]*Acta Radiologica*, 1922, 319; [39]*Ibid.* 1921, 171; [40]*Ibid.* 1921, 26; [41]*N. Y. Med. Jour.* 1921, 447; [42]*Med. Record*, 1921, 101; [43]*N. Y. Med. Jour.* 1921, 444.

## YAWS.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

W. L. Moss and G. H. Bigelow[1] record a valuable analysis of 1046 cases of yaws seen in the Dominican Republic. The primary lesion was found on the lower extremity in 82·87 per cent in increasing frequency from below upwards, as was also the case in the 8·26 per cent of such lesions on the upper extremity; in only 1·03 per cent were the genitalia affected, in half of which the patients were under 8 years of age, pointing to the frequency of minor injuries on exposed parts of the body as the sites of infection. In cases showing only the primary lesion the average age was 6·6 years and the duration 2·3 months, figures which steadily increase through the secondary and late secondary, to reach 29·3 years of age and 16·3 years' duration in the tertiary lesions, more than one stage, however, often being seen at the same time. The early or florid secondary stage shows the typical multiple lesions leaving pigmented or leucodermic scars, while arthritis and dactylitis are also fairly common. They class as late secondaries successive crops of a few granulomata with intervals of freedom spread over a number of years, with an average age incidence of 9·3 years and an average duration of the total disease at the time seen of 29·6 months. They next describe, under the name of 'clavus', painful lesions affecting the soles of the feet, differing from granuloma affecting this part of the body from which it results by the development of hard, dry cores like the head of a nail (*Plate XLVII, A*); these drop out and leave circular depressed openings producing a honeycombed or moth-eaten appearance when numerous, as shown in *Plates XLVII, XLVIII, B, C.* These lesions are very painful and disabling, but yield to the specific treatment, and were the commonest form of the disease seen without other yaws lesions, and are thus of great importance; their average incidence was 21·6 years and the average duration of the disease 9 years. In a very small number of cases somewhat similar lesions were seen on the palms of the hands. Under the term 'studded lesions' they describe groups of nodules thickly studded and regularly set over an area 8 to 10 cm. in diameter, advancing at the margins and healing in the centre, which they only found in patients with scars or other lesions of the disease, and therefore believe to be caused by yaws. They agree that yaws is quite distinct from syphilis, but the tertiary stages with extensive scarring are difficult to distinguish from the latter disease. They also describe latent cases without active lesions in patients who give a history of repeated outbreaks, and so are worthy of treatment to prevent such recurrences.

Treatment.—They confirm the universal experience in the remarkable specific effects of **Salvarsan** in yaws, although they did not obtain as many cures with a single dose as some reporters; but most of their cases were not seen later than one week after the injection, so they had to class many as 'practically cured' which under longer observation would have been included as cures. Their results showed 16·32 cured, 14·56 practically cured, 31·41 much improved, 22·1 improved, and 15·61 per cent unimproved.

A. Viswalingam[2] deals with the treatment and prophylaxis of yaws as seen in Malaya, where it is commonly associated with insanitary conditions leading to infection through an abraded surface, possibly aided by the house-fly, while nursing mothers may be infected by their infants, children being most affected. He used **Novarsenobillon** in doses of from 0·1 grm. in infants to 0·9 in adults, divided into two doses in the case of out-patients, with an interval of not less than a week, with very good results; the drug was given intravenously in all but 4 of 3000 injections. He thinks at least 25 per cent of the population are affected at some time in their life. The people flock in hundreds for the treatment, which is capable of stamping out the disease if extensively carried out.

References.—[1]*Johns Hop. Hosp. Bull.* 1922, Feb., 43; [2]*Ind. Med. Gaz.* 1922, May, 172.

## YELLOW FEVER.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

H. Noguchi[1] reports further on prophylactic inoculation and serum treatment in yellow fever. **Immune Serum** prepared in the horse was found to prevent infection of guinea-pigs if given during the incubation period, and prevented death if administered after the disease had appeared, as small a quantity as 0·001 c.c. subcutaneously neutralizing 5000 minimal lethal doses of the *Leptospira icteroides.* In yellow fever in man in several outbreaks, and

## YAWS

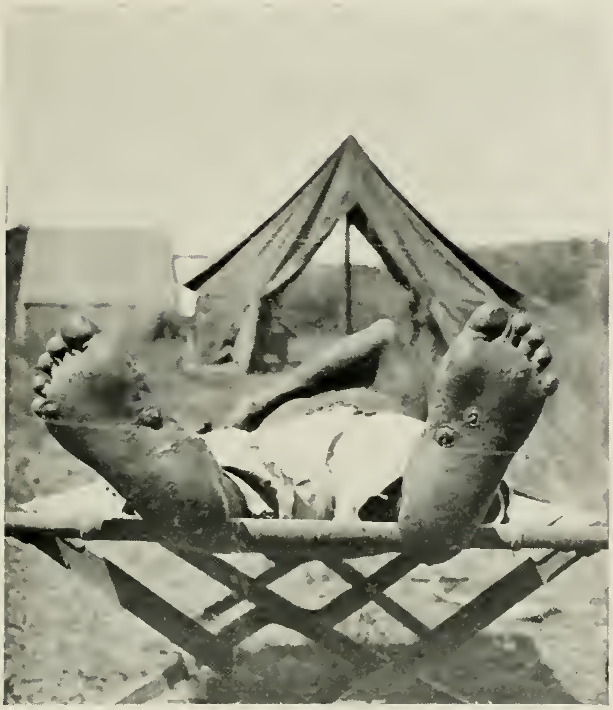


*Fig. A.*

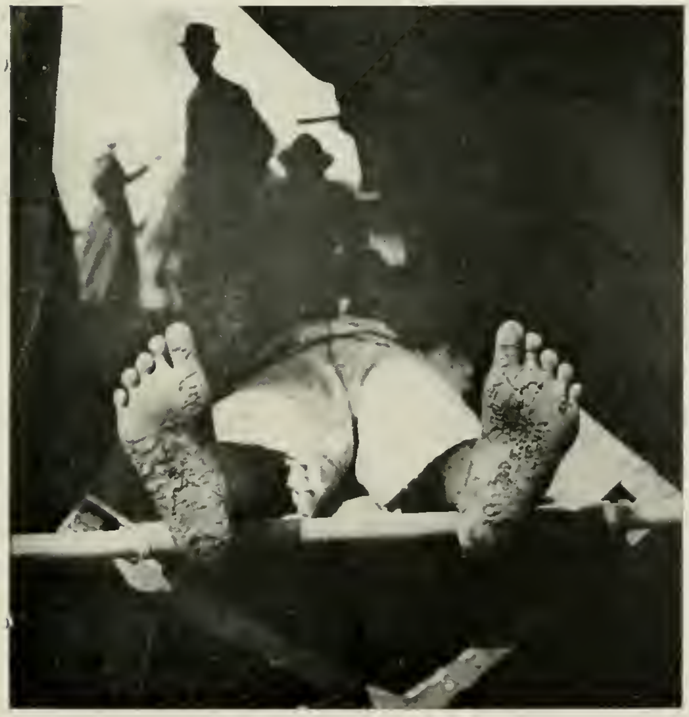


*Fig. B.*

*By kind permission of the 'Johns Hopkins Hospital Bulletin'*

# PLATE XLVIII.

YAWS—*continued*

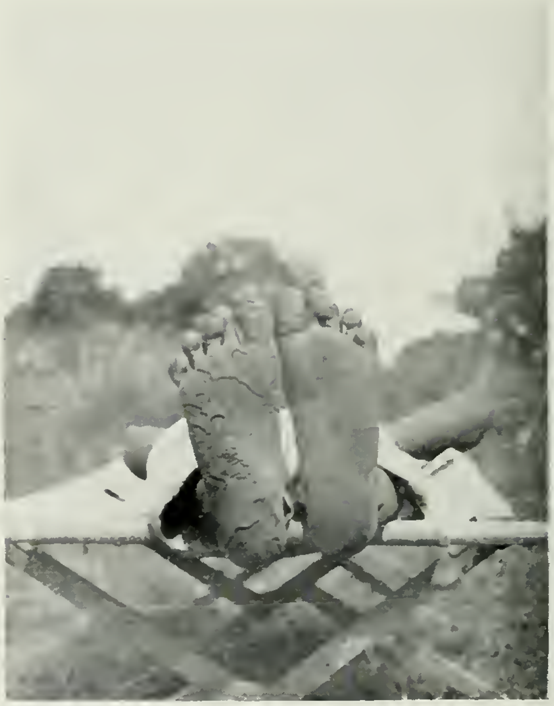


*Fig. C.*

*By kind permission of the 'Johns Hopkins Hospital Bulletin'* excluding an exceptional series at Tuxpan, with 25 per cent of cases treated in the first three days, the mortality in 59 such early cases was only 4, in 3 of whom only small doses were given. From the fourth day on, the serum has comparatively little effect, but in the earlier stages its efficacy is undoubted by cutting short the infection before it has caused irreparable injury to the organs, especially the kidneys. By the fourth day it is too late to get this effect, although marked improvement may still result. Of 95 cases treated before the third day the mortality was 13·6 per cent, and among the untreated 56·4 per cent, but after the fourth day it was 52 per cent.

**Vaccination** against yellow fever confers immunity on animals for at least five to six months, the maximum duration not having yet been determined. It has also now been used in human beings with satisfactory results with a vaccine containing 2000 million organisms per c.c., with which in Salvador with a non-immune population of about 113,000, 3607 received two injections of vaccine with no yellow fever cases, but an incidence of 1·6 per 1000 among the unprotected. In Tuxpan, Mexico, cases occurred among the vaccinated in the first two weeks, but none later, although the epidemic continued unabated; it is thus a valuable addition to the anti-*Stegomyia* campaign against yellow fever, although protection does not become effective until about ten days after the second injection.

Connor[2] at Guayaquil has freed 30,000 water receptacles by adding top minnows, a kind of sardine, to them, the mosquitoes being reduced to under 2 per cent.

H. R. Carter[3] has carried out successful anti-*Stegmoyia* measures in Peru, and thinks it will be possible shortly to free the West Coast of America permanently of yellow fever.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1921, July 16, 181; [2]*Ibid.* 1921, Oct. 1, 1139; [3]*Amer. Jour. Trop. Med.* 1922, March, 87.

# *Miscellaneous.*

## THE EDITOR'S TABLE.

*Samples (not returnable) and particulars for this section should be sent to The Editor, 'Medical Annual' Offices, Stonebridge, Bristol, on or before* NOVEMBER 30.

*We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the* MEDICAL ANNUAL *has come to be valued.*

### *NEW PHARMACEUTICAL PRODUCTS AND DIETETIC ARTICLES.*

*We are always ready, when a sufficient quantity is sent to us* EARLY IN THE YEAR, *to arrange for these to be tested in hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires.*

### *NEW MEDICAL AND SURGICAL INSTRUMENTS AND APPLIANCES.*

*We give Inventors and Manufacturers the opportunity of bringing their work before our readers entirely free of cost to themselves, subject only to the following conditions:—*

(1) *Each article sent for notice must have the novelty or improvement claimed for it clearly stated upon a* SEPARATE *sheet or sheets of paper. This should have attached to it any illustration* (WHICH MUST BE SMALL) *for which insertion is desired, and also bear the maker's name. The attention of firms who send a large number of articles for notice is particularly directed to the above condition, as each article has to be sorted into its proper department before it can be considered.*

(2) *Medical Inventors should merely describe the instrument or appliance, and avoid giving technique of operations.*

*The Editor is not able to accept reference to circulars, catalogues, or literature as a compliance with these conditions.*

## PROGRESS OF PHARMACY, DIETETICS, Etc.

**Antidote Equipment.**—Messrs. R. Sumner & Co. have put together in a portable case every possible remedy or appliance which may be required for use in a case of poisoning, together with Murrell's handbook on the treatment of poisoning. The value of such a case in an emergency is beyond question; although cases of poisoning are not so common that every practitioner will feel justified in the purchase of such an outfit, yet, in the interests of public health, such a case should be available for immediate use to any practitioner called to such an emergency. It is a matter which we would strongly recommend to the health authorities. The cost is £5 15s.

**Antimony Tartrate Preparations.**—Antimony tartrate, given intravenously in dilute solution, has proved very beneficial in various parasitic infections, notably in bilharziasis, kala-azar, and trypanosomiasis. It has also appeared to give good results in filariasis, elephantiasis, leprosy, and syphilis.

Two sizes of tablets for preparing solutions for intravenous injection are supplied containing, respectively, 1 gr. and 10 gr. of antimony sodium tartrate, with $\frac{2}{5}$ gr. and 4 gr. of sodium chloride (to render the solution isotonic). A sterilized solution is also supplied in 'Glaseptic' ampoules containing 2 gr. of antimony sodium tartrate and $\frac{4}{5}$ gr. of sodium chloride in 2 c.c. of sterile distilled water. (Parke, Davis & Co., London.)

**Atoquinol.**—A reliable antiarthritic agent possessing a pronounced analgesic, antipyretic, and antiphlogistic action. In the treatment of acute attacks of gout and articular rheumatism 4 to 8 tablets may be administered within twenty-four hours. The tablets should be taken with as large quantities of water as possible. Owing to its low melting point and its solubility in fatty solvents, atoquinol is readily absorbed by the skin, and the ointment, consequently, is of value for local applications. (The Clayton Aniline Co. Ltd.)

**Butyn.**—This is a new local anæsthetic, having important advantages over cocaine. Chemically, it is related both to cocaine and procaine. It occurs as a white amorphous powder and is freely soluble in water. It is more powerful than cocaine, a smaller quantity being required ; it acts more rapidly, and its action is more prolonged. Solutions may be boiled without impairing their efficiency.

Butyn is eminently satisfactory for use in genito-urinary work ; 4 c.c. of a 2 per cent solution may be injected into the urethra for intra-urethral examination, such as the introduction of sounds, cystoscopes, bougies, etc. In eye work the technique advised for cocaine is usually applicable.

Butyn is also a most satisfactory local anæsthetic for nose and throat operations, septum resection, adenectomy, tonsillectomy, etc. It is supplied in solution, sterilized ready for immediate use, in ampoules and 25-c.c. rubber-capped bottles, by Messrs. Allen & Hanburys Ltd., 7, Vere Street, W.1.

**Colloids.**—Messrs. R. Sumner & Co., of Liverpool, have for some time been devoting their attention to the manufacture of drugs in the colloid form. So far they have produced colloidal iodine 1–500, which has a high therapeutic efficiency because the whole of it is absorbed ; colloidal bismuth 1–2000, which is prepared from the metal and is efficient in all conditions where bismuth is indicated ; and also colloids of sulphur, silver, and iron. All these are carefully tested and will be found reliable.

*Calcium Colloid.*—Dr. Prest has recently reported on the excellent results he has obtained in the treatment of tuberculosis with calcium colloid. This preparation only represents a strength of 1–2000, but it is so chemically active that we are cautioned to increase the dose with care. The value of lime has long been recognized, but the difficulty has been to obtain a preparation which is assimilated. Now we are sure we have one, it should prove valuable in a large number of cases. Calcium colloid may be given by injection in doses of 0·5 c.c., and a dose every five days is usually sufficient. It may also be given by the mouth. It is prepared by the Crookes Laboratories, 22, Chenies Street, W.C.1.

**'Dermaseptic' Shaving Soap.**—This consists of a specially selected neutral soap with which mercury biniodide is incorporated in quantity sufficient to exert a definite bactericidal action. It is designed to protect the user from the danger of accidental razor-cuts becoming infected by septic or other organisms, serious instances of which are by no means uncommon. The process of working up a lather with this soap effects the destruction of all bacteria within the area treated.

This soap is also useful for sterilizing the site of a hypodermic injection by merely moistening the top of the stick and rubbing it over the skin. It is supplied in aluminium cases, refills for which may be had at any time. (Parke, Davis & Co., London.)

**Diabetic Flour.**—This contains a mixture of caseins, lactalbumen, and leavening agents, and it is entirely free from sugar, starch, and gluten. From it can be made bread, tea-cake, and a variety of biscuits, all of which are quite palatable. This is a happy solution of the problem in those cases where a carbohydrate-free diet is necessary. Messrs. Allen & Hanburys, the manufacturers, give a number of recipes for converting the flour into palatable foods.

**Diabetylin.**—For the treatment of diabetes mellitus without withdrawal of carbohydrates from the dietary, diabetylin is actually an auxiliary foodstuff for increasing the carbohydrate tolerance of sufferers from diabetes. It is composed of a vegetable trypsin and yeast specially treated. It does not attack the sugar, but digests the albumen, arrests the putrefaction, and thus restores activity to the ferments, which are then capable of carrying out their function of modifying the sugar for assimilation. Decrease in sugar percentage and increase of body weight are noticed. (The Anglo-French Drug Co., 238A, Gray's Inn Road, W.C. 1.)

**Didial.**—Most cases of insomnia yield to dial treatment, but didial is of special service in grave insomnia due to neurasthenia, and where there is much psychic disturbance. It has also proved valuable in the treatment of delirium tremens. (The Clayton Aniline Co. Ltd.)

**Ferrophytin.**—This product is a neutral colloidal salt of inosite-hexa-phosphoric acid. Being insoluble in the gastric secretion, ferrophytin passes through the stomach without causing disturbance. In the intestine, however, it forms a colloidal solution which is readily absorbed and utilized by the organism. Ferrophytin has proved of special value in the treatment of anæmia. (The Clayton Aniline Co. Ltd.)

**Gencydo.**—This is a preparation for the treatment of hay fever, manufactured by the International Laboratories Co. Ltd., Arlesheim, Switzerland. The Clinical and

Therapeutical Institute in Arlesheim has treated a number of cases of hay fever with remarkable success, and Dr. L. London says: "Your preparation for hay fever is marvellous in its efficiency. I tried it on a dozen cases last summer, and every one was loud in their praise of it, so astonished were they at the result".

Genecydo is a preparation of gentiopikrin (a glucoside contained in gentian root) and extract of quince seed. It is put up in ampoules for injection, and as a liquid and ointment for local application, by the Anglo-French Drug Co. Ltd., 238A, Gray's Inn Road, W.C.1.

**Glandular Products.**—Messrs. Allen & Hanburys Ltd., 7, Vere Street, W.1, have specialized for many years in the preparation of active gland substances. They send us a sample of a multiglandular preparation under the proprietary name of 'polyglandulin' which is recommended as being employed with success in nutritional disturbances and neurasthenic troubles. It contains the active autacoid principles of the thyroid, parathyroid, ovary, testis, and suprarenal glands.

**Hemypnone.**—Hemypnone is now being used in a number of hospitals and maternity wards with satisfactory results. It possesses the advantage over the ordinary morphine-scopolamine injection in that it can be administered by the mouth. (The Clayton Aniline Co. Ltd.)

**Lipoiodine.**—This is a derivative of a fatty acid, ethyl di-iodobrassidate, and contains as much as 41 per cent of assimilable iodine. Not being decomposed in the stomach, it passes through it without producing any gastric disturbance, but is readily absorbed into the system. Its dissociation is so slow that the full therapeutic effect of the iodine content is obtained without any risk of iodism. (The Clayton Aniline Co. Ltd.)

**Neo-Protosil.**—This preparation contains silver iodide (about 20 per cent) in a state of colloidal subdivision, combined with a soluble protein base. It is in the form of cream-coloured scales readily soluble in water. Its solutions are powerfully bactericidal, and possess the advantages over most other silver preparations of being non-irritant to mucous membrane and not causing dark stains. Solutions of neo-protosil, ranging in strength from 1 per cent to 50 per cent, are employed in inflammatory conditions of the eye, nose, throat, urethra, vagina, etc.

Neo-protosil is supplied in bottles containing ½ oz. or 1 oz.; also in capsules containing 6 gr., which are convenient for making up solutions without weighing—the contents of one capsule added to 2 fluid drachms of water form a 5 per cent solution. (Parke, Davis & Co., London.)

**Ovarian Residue Soluble Extract.**—The term ovarian residue is used to indicate the ovarian tissue from which the corpus luteum has been removed at the period of its maximum development. The use of this substance is indicated in cases in which it is desired to cause ovarian stimulation without increased activity of the corpus luteum. It is prescribed in the treatment of abnormally frequent menstruation, also in amenorrhœa, dysmenorrhœa, sterility, and the disorders of the menopause.

In addition to the dried substance supplied for oral administration, a soluble extract for hypodermic injection can also be obtained. The dose is 1 c.c., to be given on alternate days. (Parke, Davis & Co., London.)

**Ovarian Substance Soluble Extract.**—Messrs. Parke, Davis & Co. have for some time been supplying the desiccated ovarian substance in the form of tablets, but the demand having arisen for a preparation that can be injected hypodermically and so avoid contact with, and possible alteration by, the gastric secretions, they now prepare a soluble extract in 'Glaseptic' ampoules containing 1 c.c., which amount is injected intramuscularly on alternate days. This extract is employed in the treatment of delayed development, or imperfect development, of the female reproductive system, and in the physical, nervous, and mental disturbances of the menopause or subsequent to oöphorectomy. It has been reported to be beneficial in cases of functional dysmenorrhœa, menorrhagia, and metrorrhagia, and also in osteomalacia and certain forms of hysteria and neurasthenia.

**Peptone Injections for Asthma.**—Messrs. R. Sumner & Co., of Liverpool, have undertaken the manufacture of peptone injections for asthma, and will send particulars to any practitioner who is desirous of carrying out a treatment which has given excellent results in a number of cases.

**Protein Therapy Outfits.**—These outfits contain two tests each of 18 groups representing 89 different proteins. The proteins are prepared from food substances, wool, feathers, hairs, etc., and the groups are arranged so that they contain, as far as is possible, associated proteins. The use of the groups obviates the tediousness of testing with each protein. Individual protein tests can also be supplied. The proteins are in solution in capillary tubes, in which form they are most active and stable.

These tests are now in demand, as their use forms a valuable guide in the treatment of asthma, angioneurotic œdema, and epilepsy, conditions which are due to a hypersensitiveness to protein substances. For the specific treatment of these conditions, standardized antigens are supplied which are administered in much the same way as vaccines. (Allen & Hanburys Ltd., 7, Vere Street, W.1.)

**Safety-cap** (*Fig.* 44).—The 'Daccol' Safety-cap has been invented for the purpose of bottling a stock of sterile solution for hypodermic use. This simple device consists of a spongiose rubber disc, between two layers of vulcanized rubber sheeting, fixed in compression on the bottle-neck by means of an aluminium ring. The rubber disc is absolutely self-closing after withdrawal of the needle, so that any amount may be extracted from the bottle without contaminating the remainder. It is economical, there being no waste, as when using ampoules. It is convenient, unlike the practice of dissolving tablets.

The sole rights are held by the Drug & Chemical Corporation, Ltd., 41, Lower Kennington Lane, S.E.11, who use this cap exclusively on all their vaccines and other sterile solutions, and will be glad to send their descriptive literature to all interested in vaccines and their administration.

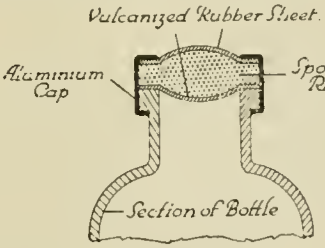


*Fig.* 44.

We regard it as a most practical and convenient method of keeping sterile solutions, such as cocaine, quite apart from vaccines.

**Scleron.**—This has been employed with excellent results in the early stages of arteriosclerosis. Its use is based upon the similarity between cases of lead poisoning and the symptoms of arteriosclerosis, which, in accordance with a well-known pharmacological law, suggests that minute doses of lead might possess a curative action. The results of clinical experience support this view, and scleron can be recommended with every confidence.

The Anglo-French Drug Co., who produce this preparation, also supply a second form, prepared from *Betula alba*, which stimulates diuresis, and is given by injection.

**Sistomensin.**—This preparation is now being regularly prescribed by many authorities as a physiological regulator for, and stabilizer of, menstruation in cases of hyperfunction. It presents an extract of the specifically active hormone of the ovarian corpus luteum. (The Clayton Aniline Co. Ltd.)

**Stabilarsan.**—This is an arsenobenzol preparation which, unlike salvarsan and neosalvarsan, needs no preparation before injection, the syringe being filled direct from the ampoule. It has also the advantage of having a lower toxicity without any sacrifice of curative power, as is shown by its effect on the Wassermann reaction. It has been approved by the Ministry of Health, and many eminent venereal surgeons have used it with excellent clinical results. It is available for use in public institutions at the reduced rate of the Ministry of Health scheme. Boot's Pure Drug Co. Ltd. are the manufacturers.

**Tabellæ Bronchialis.**—These tablets have an ammonium cloride basis and contain also benzoic acid, camphor, cubebs, liquorice, and aniseed, also opium $\frac{1}{32}$ gr. They act as a stimulating expectorant, and have been very efficient in catarrhal conditions of the larynx and bronchial tubes. They are made by Messrs. Sumner & Co., Liverpool.

**Trépol and Néo-trépol.**—These preparations are being used in treating syphilis. Trépol contains tartro-bismuthate of potassium and sodium (64 per cent Bi) in oily suspension. This was the original preparation used in the Paris hospitals, but, more recently, the preparation néo-trépol, which contains precipitated bismuth (96 per cent Bi) in isotonic solution, has given such excellent results that it has practically superseded trépol in the treatment of both adults and infants. "As for the best indications for the bismuth compounds, a point upon which all clinicians are agreed is that they should be used in all cases affected with specific lesions which are resistant to mercury or arsenic, or in which recidivation occurs. In such cases bismuth gives really remarkable results."

Trépol and néo-trépol are being used with great advantage in hospitals both at home and in the U.S.A., as well as in Paris. (Modern Pharmacals Ltd., 2, Calthorpe Street, W.C.1.)

**Tubercle Vaccine R.**—This curative and prophylactic tubercle vaccine, introduced and used by Dr. Nathan Raw, is prepared from bacilli which have become non-pathogenic through being subcultured without a break for fourteen years. Natural attenuation, while removing the virulence and toxicity of the organism, enhances the value of the vaccine in the treatment of disease. The results obtained with the new vaccine in local and general tuberculosis are such as to warrant a thorough trial, as it possesses a remarkable power of controlling and of preventing the spread of infection in the human body. (Allen & Hanburys Ltd., 7, Vere Street, W.1).

**Vioform.**—This speciality is an odourless iodoform substitute possessing potent antiseptic properties. It is sterilizable, permanent, non-irritating, and non-toxic. Vioform is stated to check suppuration and to promote a rapid formation of epidermis. (The Clayton Aniline Co. Ltd.)

**Vitamine Malt.**—The fact that vitamins cannot be isolated and given in the form of a medicine, made it necessary to seek some other way in which these could be administered. After careful consideration, it occurred to Messrs. R. Sumner & Co., of Liverpool, that no preparation was so suitable for this purpose as cod-liver oil and malt, which is regularly used as a food accessory. They therefore decided that the best way to present vitamins would be to reinforce cod-liver oil and malt with them, so that the final preparation would contain the A, B, and C vitamins to the maximum extent. This has proved an unqualified success, and not only private practitioners, but public health authorities, have taken it up, and the preparation—which has only been on the market three months—has had a most surprising sale. The presence of the fresh orange-juice (which constitutes the source of vitamin C) has practically eliminated the taste of the cod-liver oil, a matter of no small importance for children and invalids. We notice that the price is most moderate—half-pound bottles are 16s. per doz.

## MEDICAL AND SURGICAL APPLIANCES.

**Abdominal Belts.**—The name of ' Camp Belts ' has been given to a new and very efficient design of which we give an illustration (*Fig.* 45). It is a distinct advantage that the belt laces at the side and that the pull on the lower edge of the belt should be upwards, so that a lift is given to the abdominal contents. The adjustment is very simple and exact, and its advantages will be readily recognized. (Messrs. Allen & Hanburys Ltd.)

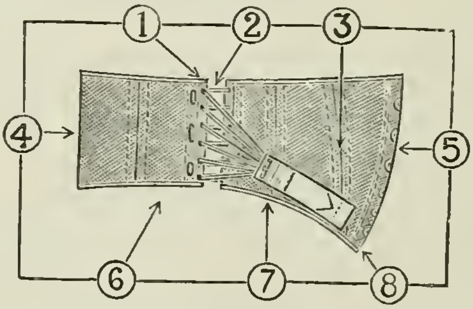


*Fig.* 45.

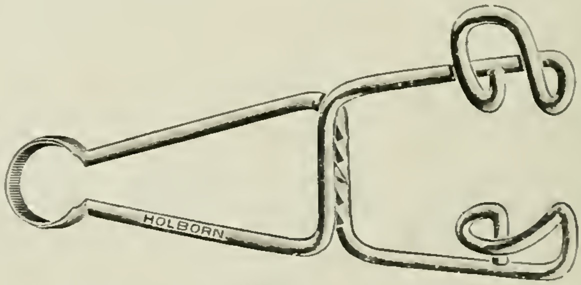


*Fig.* 46.

**Abdominal Retractor (Dartigues).**—This instrument, as will be seen by the illustration (*Fig.* 46), is of simple construction, and easily and quickly applied. (The Holborn Surgical Instrument Co. Ltd.)

**Artery Forceps (Rustless).**—These are of Kelly-Halstead type, 5 in. (*Fig.* 47). Being made in rustless steel throughout, including the screw, boiling does not affect them, and they require no cleaning. They will retain their brightness and keep a smooth surface. Price 12s. 6d. (Messrs. Reynolds & Branson, Leeds.)

**Artificial Pneumothorax, Apparatus for.**—This was described in our last issue. Messrs. Reynolds and Branson have since been able to reduce the size, without altering the construction, in order to make it portable. The dimensions of the case are 18 in. × 12 in. × 6¼ in., and the price is now reduced to £10 10s.

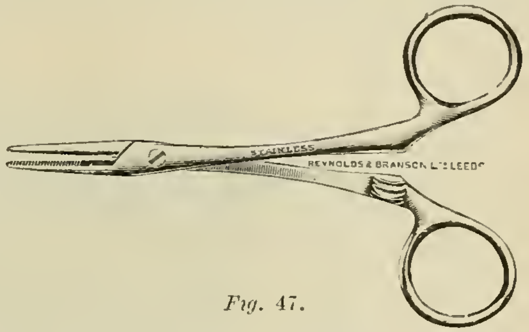


*Fig.* 47.

**Aspirating Syringe, Combined.**—This instrument (*Fig.* 48) is a simple modification of the ordinary 'Record' syringe which is intended for use in the place of the larger and more complicated apparatus employed for withdrawing pleural and other serous effusions. It differs from an ordinary record syringe in that: (1) A side tube is fixed to the metal piece at the bottom of the syringe to lead away the fluid, which is drawn up in the ordinary way into the glass barrel of the syringe; this side tube has a tap. (2) The ordinary needle is replaced by a cannula, which can be screwed on to the barrel of the syringe. (3) The ordinary stilette is replaced by a trocar, which is screwed on to the bottom of the plunger. All the parts of the instrument are detachable, and trocars and cannulas of various sizes can be obtained.

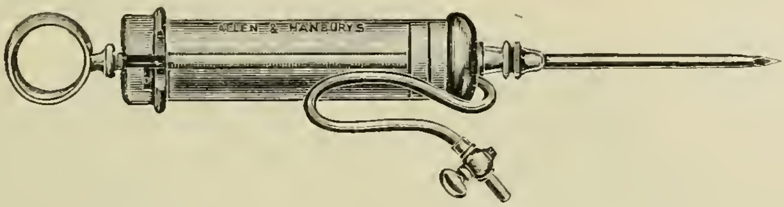


*Fig.* 48.

The instrument is used like an ordinary 'Record' syringe when employed for exploration. The fluid to be removed is drawn into the glass barrel; the tap is then opened, and the syphon is started by pushing the plunger down for half an inch or so. Now the plunger is steadied, and the fluid will keep flowing away from the serous cavity into the glass barrel and thence through the side tube into any receptacle that is used. Messrs. Allen & Hanburys are the manufacturers.

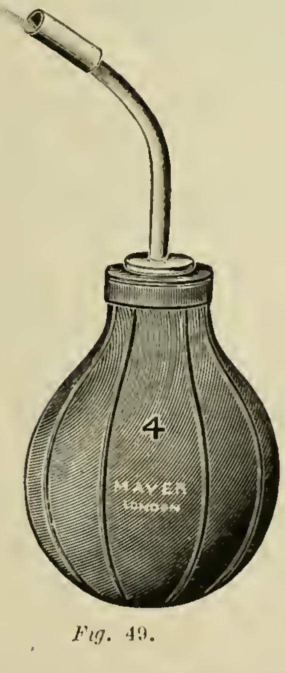


*Fig.* 49.

**Aural Syringe (Ferguson's Improved).**—As prescribed to the patients at the Hospital for Diseases of the Throat, Golden Square, and other institutions, this instrument is safe in the hands of the clumsiest patient.

The syringe is provided with a nozzle, in which is fitted the efferent tube, so shaped as to give a flat stream of water (*Fig.* 49), which is driven along the meatus and over the tympanic membrane. Considerable force may be used without danger, as the outflow is considerably greater than the ingoing stream, so that foreign matter is easily removed. (Messrs. Mayer & Phelps, New Cavendish Street, W.1.)

**Bandage Splint (Universal).**—Constructed of wire gauze covered with cotton, this can be moulded to fit any part of the body, yet it is rigid enough to secure immobility. It can be used when plaster-of-Paris is contra-indicated, e.g., in acute swelling or compound fractures with discharge. It serves as a reinforcement for plaster casts, giving greater rigidity and saving weight.

It can be used as follows: Unroll the splint (*Fig.* 50) fully, and fold it upon itself to length required. Mould into shape of trough, which can easily be done with the fingers, or it may be used straight or applied to the flexed arm, leg, or shoulder. It can be put on over the clothing in emergencies; otherwise it can be lined with lint or padded as required. (Messrs. Mayer & Phelps, New Cavendish Street, W.1.)

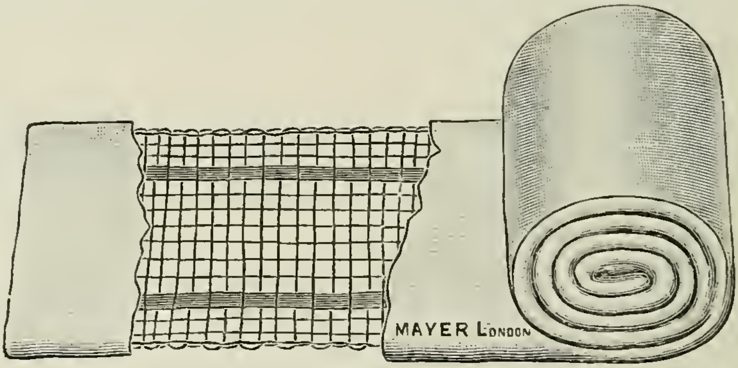


*Fig.* 50.

**Blood Collection.**—The illustration (*Fig.* 51) shows a twin needle and test tube for collecting blood from the veins for examination, designed by Dr. A. Cambell, of Portsmouth. It is devised to provide a rigid connection between the needle and the test tube, and at the same time to ensure the blood being collected in a sterile manner. Soldered parallel to the needle is a tube of similar diameter but shorter in length. Attached to the two is a flat metal plate forming a winged grip. The twin needle is passed through a perforation set eccentrically in a rubber cork, which fits tightly in a test tube of appropriate size. The object of the additional tube is to allow an exit for air to pass out as the blood flows into the tube. Holding the test tube, the point of the needle is plunged into the vein and the blood allowed to flow until the requisite quantity is obtained. After withdrawal of the needle it is removed from the rubber cork by twisting and pulling on the grip gently, the cork then being pushed firmly home. The pressure of the neck of the test tube closes the perforation and prevents leakage. The length of the test tube is convenient for centrifuging. The outfit is enclosed in a wooden box, and can be sent safely through the post.

The makers are Messrs. Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E.1.

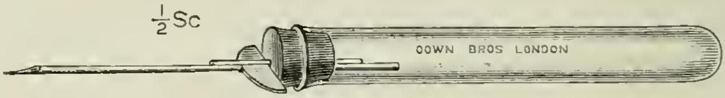


*Fig.* 51.

**Catgut.**—Messrs. Allen & Hanburys have produced 'London Hospital' catgut fitted with improved Souttar's needles. After a great deal of experimental work, these needles have been made of the same sizes as the standard patterns of intestinal needles. They are fitted with a fine piece of silver tube, at the end of which the catgut is securely fastened. The end of the needle being tubular, there is no sharp edge left, as is the case when the catgut is clamped to the end of the needle.

Further, it has been so constructed that it is of the same diameter as the catgut throughout, and thus the catgut completely fills the hole through which the needle has passed. These needles are put up in glass tubse, sterilized and ready for use.

**Catheters and Bougies.**—These are woven of a flexible material and coated with gum, which is a metallic combination (*Fig.* 52). This renders them capable of being sterilized repeatedly without detriment. The interior of the catheter is smooth, thus allowing them to be readily cleaned. They are supplied by Messrs. Reynolds & Branson, of Leeds, either as coudé or à boule catheters, and also bougies.

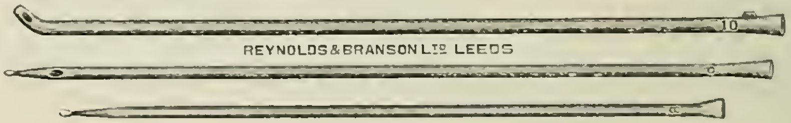


*Fig.* 52.

**Catheterization and Pyelography Outfit.**—Mr. J. Alban Andrews has designed a box to hold all the catheters and instruments likely to be required in these operations, and has also planned the box so that formalin is used to sterilize the catheters.

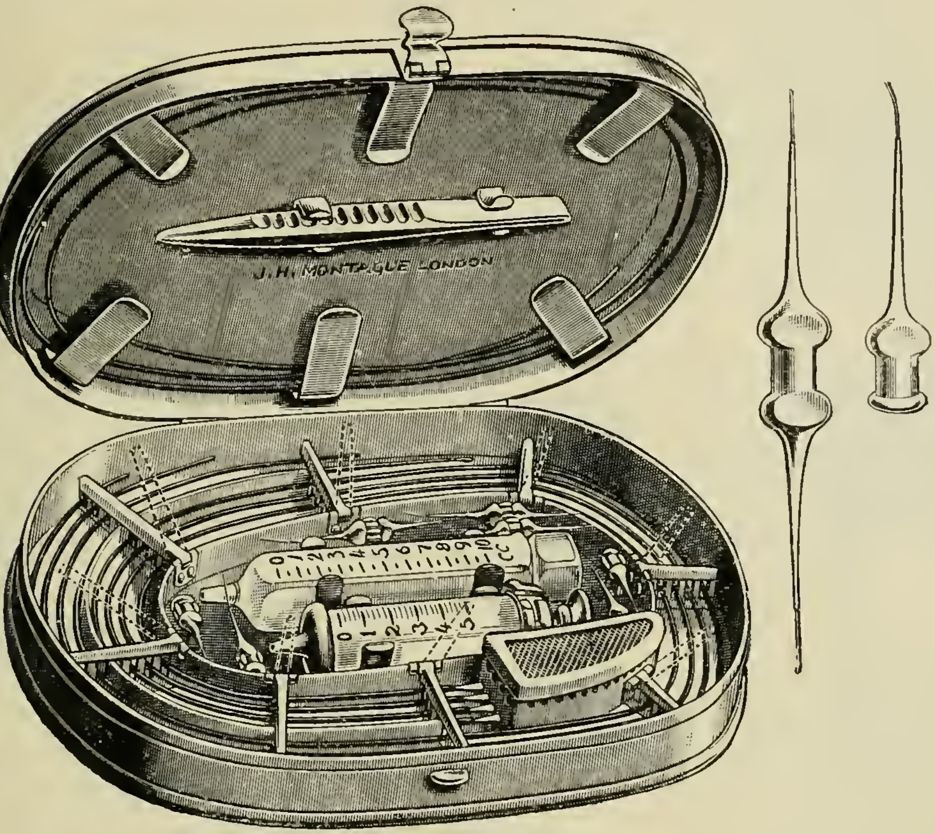


*Fig.* 53.

As will be seen from the illustration (*Fig.* 53), there is space for two syringes, forceps, etc. The whole outfit is portable and convenient. Mr. J. H. Montague, 69, New Bond Street, W., is the manufacturer.

**Cheek Retractor for Tonsil Operations.**—This self-retaining retractor (*Fig.* 54), designed by Mr. Douglas Guthrie, F.R.C.S., of Edinburgh, will be found useful for holding the cheeks apart in such operations as removing the tonsils by dissection (Waugh's

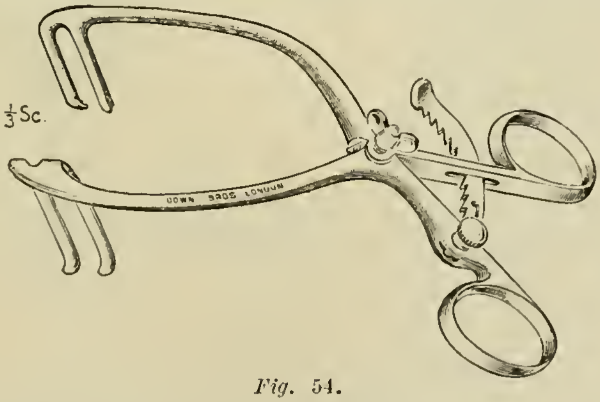


*Fig.* 54.

method). Mr. Guthrie uses a Backhaus' towel clip for holding the tongue forward; the bow handle of the clip is retained in position by the groove in the centre fly nut of the retractor, the handles of which are bent down so as to be out of the way.

The instrument is made by Messrs. Down Bros. Ltd.

**Chromoscope (Nephrometric)**, for the clinical exploration of the renal functions (*Fig.* 55).—An apparatus invented by Dr. Lian and Dr. Siguret which affords a simple means of making the phenolsulphonephthalein test.

It consists essentially of a turning cylinder provided with twelve screwed holes arranged in pairs; these holes are intended to receive the twelve standardized tubes of the colorimetric scale (glass tubes coated with a coloured varnish). On the right are screwed the tubes corresponding to a solution which contains, for 1 litre (1·76 pint), 15, 25, 35, 45, 55, 65 per cent of the 6 mgrm. of phenolsulphonephthalein injection. Opposite them, on the left, are screwed the tubes similarly standardized at 10, 20, 30, 40, 50, 60 per cent.

The cylinder is enclosed in a wooden box, on one side of which is an opening to receive the tube with the diluted urine which is to be tested. This opening is so made that the urine tube will be placed exactly between two tubes, one odd and one even, of the colorimetric scale.

On the anterior face of the box, at an appropriate height, is a horizontal slit through which it is easy to compare the coloration of the diluted urine and the standardized tubes. On the upper third of its posterior face is a pane of ground glass which provides light.

The cylinder is turned by a handle, the complete rotation being accomplished in six equal turns, each turn being marked by a catch. Each catch enables one to compare the coloration of the urine tube with that of the two standardized tubes which are on its right and left: 10 and 15, then 20 and 25, and so on. It is thus easy to ascertain quickly the amount of phenolsulphonephthalein in the tested urine. The cost is fr. 87.50, and the apparatus is made by E. Spengler, 16 rue de l'Odéon, Paris, 6e.

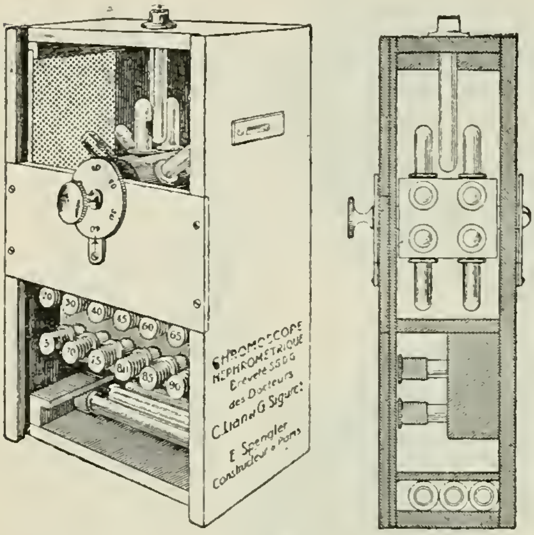


*Fig.* 55.

**Cleft-palate Instruments.**—In tying a knot it is customary, after the first loop has been made, to place a finger on the crossed strings in order to retain them nicely in position while the second loop is being formed. The forceps (*Fig.* 56) are for the same purpose in cleft-palate operations. After the suture has been once tied, it is gripped by the jaws of these forceps while the second loop is being made, thus preventing the suture slipping, and maintaining the desired tension. It is designed by Dr. Alex. Mitchell, Aberdeen, who has also devised some scissors with serrated jaws (*Fig.* 57) for cleft-palate operations. They are of a convenient size and angle for use when detaching the soft from the hard palate. The serrated edges have a tendency to prevent the tissues slipping out of the jaws when the instrument is closed.

The makers of both these instruments are Messrs. Down Bros. Ltd.

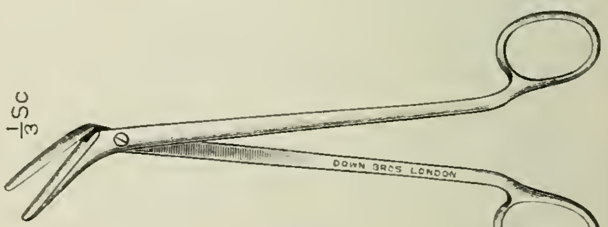


*Fig.* 56.

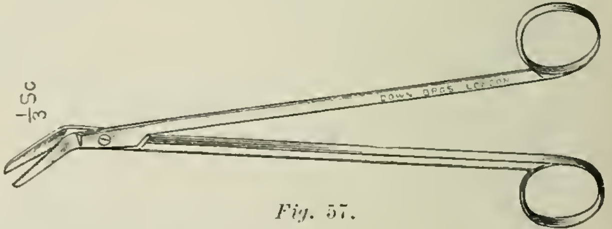


*Fig.* 57.

**Cover-slip Holder for Microscopical Work.**—This instrument is probably best understood from the accompanying illustration (*Fig.* 58). It consists of a stiff bent wire framework, fused into a glass rod handle. The wire is twisted into the shape of two 'Y's' one above the other and united by cross-piece continuations at all three ends of the arms of one 'Y' to the other 'Y'. The cover-slip is inserted between these arms, where it will remain in all positions except one, i.e., when the instrument is held end downwards, when the cover-slip slides gently out on the slide as required. At the choice of the user, the glass rod handle may be bent in the flame, at right angles, or circularly, so that the holder will not roll, and an upward bend to the wire stem leaves the slip secure and steady. The wire has been chosen to stand the flame well, and will not readily corrode with wet or chemicals. It is, however, quite pliable, and can be easily bent between the fingers to hold any size of cover-slip. Messrs. Allen & Hanburys Ltd. are the manufacturers.

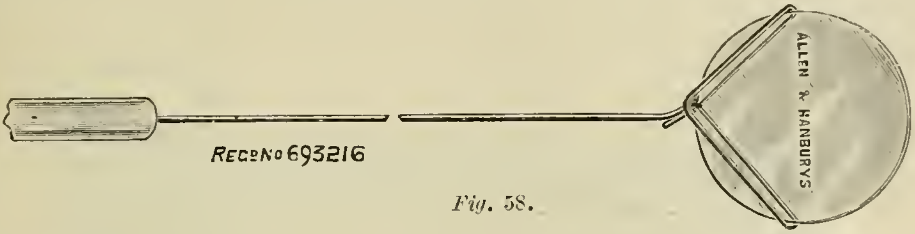


*Fig.* 58.

**Domen Belt Corset.**—An improved model of this corset has been submitted to us, which is a great advance on the former type which we have previously recommended, on account of its efficiency.

This model is cut lower in the bust, is much lighter and more attractive in appearance (*Fig.* 59), which will make it easier for us to induce our lady patients to wear it.

The average corset does nothing to support the abdominal viscera, and much feminine trouble is due to enteroptosis. The relief given in suitable cases by this corset belt is surprising. (The Domen Belts Co., 456, Strand, W.C.2.)

*Fig.* 59.

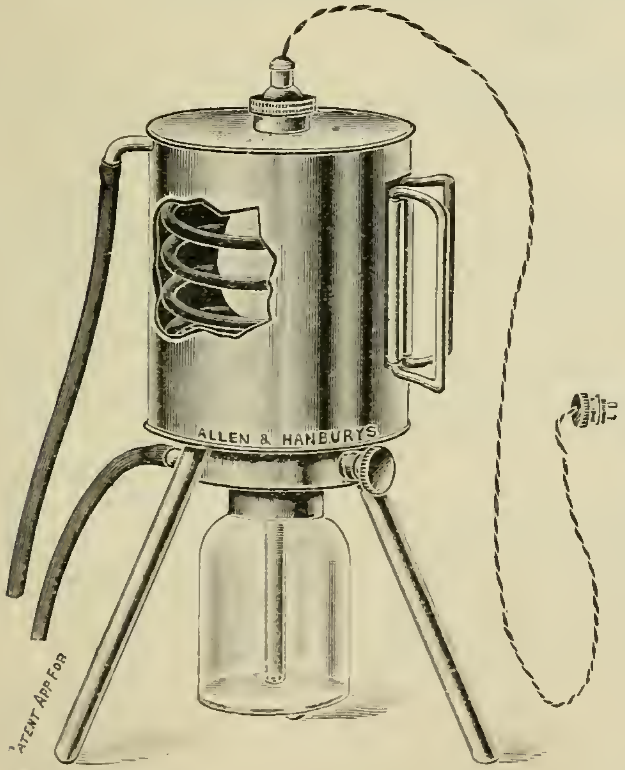


*Fig.* 60.

**Ether Inhaler (Travers').**—This apparatus consists of a jacketed coil into which an electric lamp is inserted, as shown in the illustration (*Fig.* 60). It is fitted with a bottle for holding ether, and a tripod stand; the legs and bottle are easily removable, and the bottle may be carried inside the jacket.

With this apparatus the air is sprayed through ether and afterwards warmed. The inhaler has been constructed on scientific principles, and really hot ether-air mixture is obtained. Where electric current is not available, the jacket can be filled with hot water.

It is fitted with a needle valve for adjustment to regulate the amount of air passing through the ether.

The bottle can be refilled when required through the funnel at the side, without dismantling.

Messrs. Allen & Hanburys are the manufacturers.

**Forceps (Pedicle) for Nephrectomy.**—These forceps (*Fig.* 61) were designed by Mr. Henry Wade, to provide a powerful crushing hæmostat which could be conveniently applied to the blood-vessels of the renal pedicle and simplify the subsequent ligation of them. The blades are strong, broad, and serrated, and have on their convexity a notch which facilitates transfixing the pedicle without the risk of having hæmorrhage from puncturing a vessel. The blades are curved, which renders easier the passage of the loop of the ligature over the point when it is being tightened. It is thought that they will be found a convenient and useful instrument.

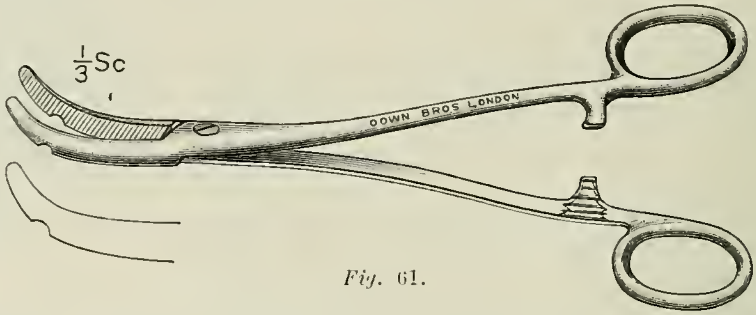


*Fig.* 61.

The makers are Messrs. Down Bros. Ltd.

**Forceps for Removing Michel's Clips.**—These forceps (*Fig.* 62), suggested by Mr. L. R. Braithwaite, have a fine end which can be readily introduced below the clip when *in situ*. They are provided with a fairly broad handle, which ensures a good grip and steadiness when withdrawing the clips. The tip is curved, and on the opposite blade a corresponding single piece causes the clips to double back when pressure is applied. Price £1 1s. (Messrs. Reynolds & Branson, Leeds.)

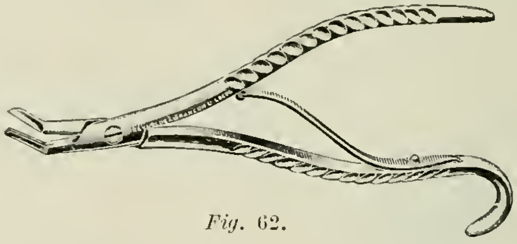


*Fig.* 62.

**Forceps (Suturing).**—This instrument (*Figs.* 63 and 64) is a modification of the finger-grip forceps devised by Dr. Collins, of Duluth, U.S.A. It is intended to facilitate anastomosis of hollow viscera by means of the Connell-Mayo running suture. The single arm is inserted under the gut, and the double arm pressed down from above. The edge is thus conveniently elevated to receive the needle, which penetrates from the serous to the mucous, and the mucous to the serous side, in one thrust. The procedure is repeated on the opposite side of the incision. It is thought that the bow handle will make the instrument more convenient to handle than the original model, and that the small projection on the under surface of the central blade is useful in

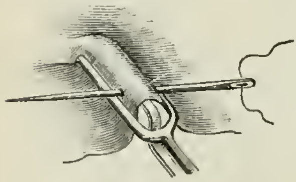


*Fig.* 63.

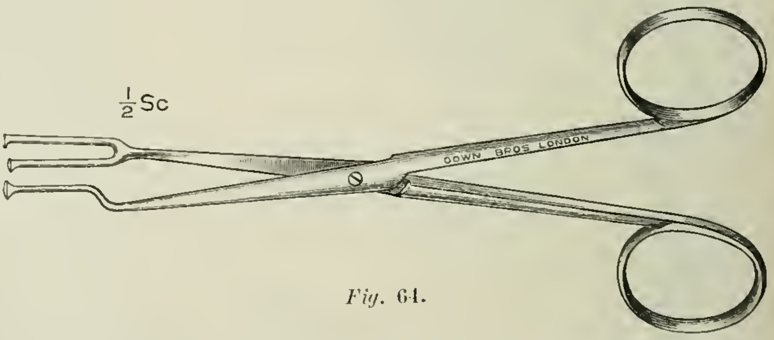


*Fig.* 64.

pressing back evaginated mucous membrane and bringing it into line with the muscular and serous coats. It is designed by Mr. D. P. H. Wilkie, Edinburgh, and made by Messrs. Down Bros. Ltd.

**Gag and Tongue Retractor.**—This is a copy of the instrument used by Dr. Davis, in America, and because of its convenience Mr. Edmund G. Boyle has asked Messrs. Mayer & Phelps to make it. The principle is that of the hanging laryngoscope, and it has five spatulæ of different sizes so that it can be used for children. It gives a perfect view of the tonsils, and the air-way is kept clear (*Fig.* 65).

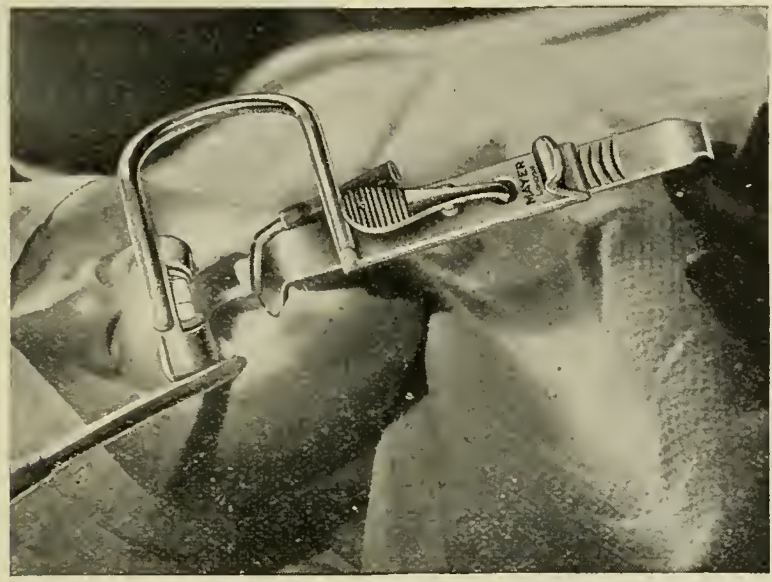


*Fig.* 65.

Mr. Boyle uses this gag in conjunction with a suction apparatus and ether blower.

**Hæmorrhoidal Suture Clamps.**—Dr. James MacMunn writes as follows: "To cause a wound to heal by first intention rather than by the slow method of granulation (ligature method) is surely more surgical, and it is chiefly to ensure quick union and to guard against sepsis that I wish to bring the present method for the treatment of hæmorrhoids by suture into notice. The forceps illustrated (*Fig.* 66) is a modification of Ricard's phimosis forceps, but the slot is much smaller, allowing only the passage of a small domestic needle. It is also open at the end. A is an enlarged section showing how the tissues are compressed above and below the slot for suture. The forceps is clamped on the pile in the gut axis and the pile lifted well into the blades by a pile forceps before clamping. The pile is then cut off, and the suture, anointed with B.I.P.P., is used as shown in the lower part of the illustration; B embraces the pile-supplying artery. Very little sustaining power is required by the suture to keep the tissues together; they are pressed into apposition, and B.I.P.P. is rubbed over the part. The instrument is made for me from my model by the Holborn Surgical Instrument Co. Ltd."

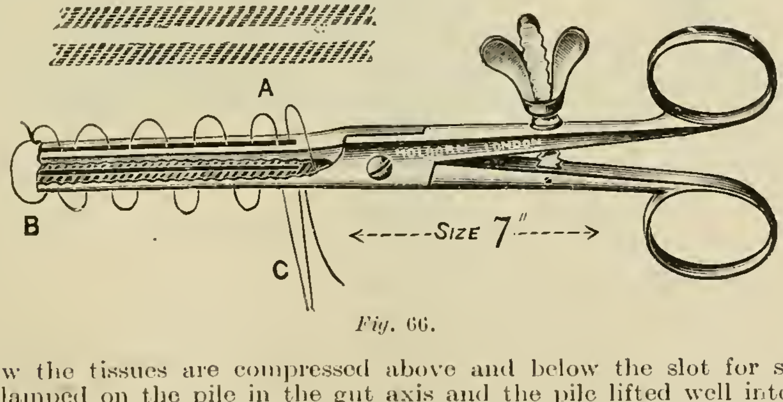


*Fig.* 66.

**Hare-lip Forceps.**—The illustration (*Fig.* 67) is of a light spring forceps designed by Mr. John Fraser, of Edinburgh, for the control of hæmorrhage in operations for hare-lip. They are also an assistance in the manipulation of the lip during the operation. The makers are Messrs. Down Bros. Ltd., London, S.E.1.

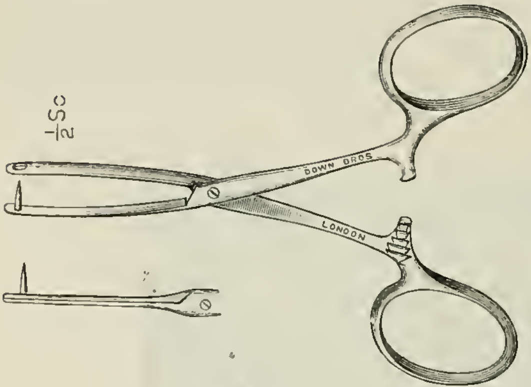


*Fig.* 67.

**Hypodermic Needle ('The Summit').**—These are intended for 'Record' syringes, and have one advantage which will commend them to most practitioners: the wire can be threaded from the cone end, instead of the point. This saves a lot of time and trouble. They are supplied by Messrs. A. E. Braid & Co., 30, Gower Place, W.C.1.

*Fig.* 68 illustrates a new needle which is made practically in one piece, as the mount is welded to the needle in a molten state. This does away with the thread which is usually cut in the needle to screw it into the mount, and is the cause of needles breaking off at the joint during use. The special concave shape of the mount allows of a firmer grip.

The Holborn Surgical Instrument Co. Ltd., stock these needles in both hypodermic and serum size.

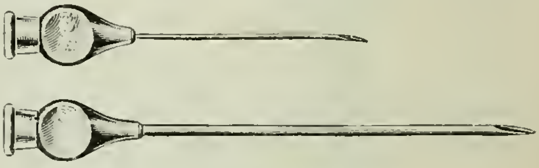


*Fig.* 68.

**Inhaler (The De Caux).**—This is an improved form of ether inhaler which combines all the advantages of open ether administration without the disadvantages. As will be seen by the illustration (*Fig.* 69) it is fitted with a stopcock at the side, through which nitrous oxide or oxygen can be given. There is also an arrangement by means of which ethyl chloride can be sprayed directly into the bag. A shutter is fitted by which the addition of air is regulated. The ether from the reservoir drops upon the perforated wire gauze in the barrel of the inhaler.

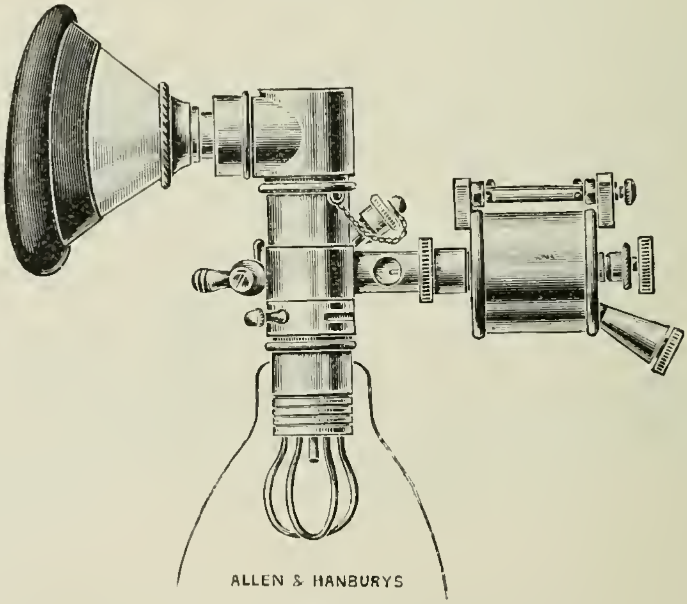


*Fig.* 69.

It has been in use at St. Bartholomew's Hospital for a long time, with every satisfaction, and is made by Messrs. Allen & Hanburys, London.

**Intratracheal Apparatus (Mennell's).**—This apparatus is a modification and improvement upon the well-known Kelly's intratracheal apparatus.

The improvement consists of the fact that the ether chamber is of metal instead of glass. The apparatus has been remodelled to render it more portable, and it is supplied fitted into a case, complete with electric motor, blower, suitable resistance, laryngeal spatula, and battery for illuminating. (*Fig.* 70.) An improved universal motor is supplied which can be used with the resistance on all voltages from 100 to 250 volts. It is made by Messrs. Allen & Hanburys.

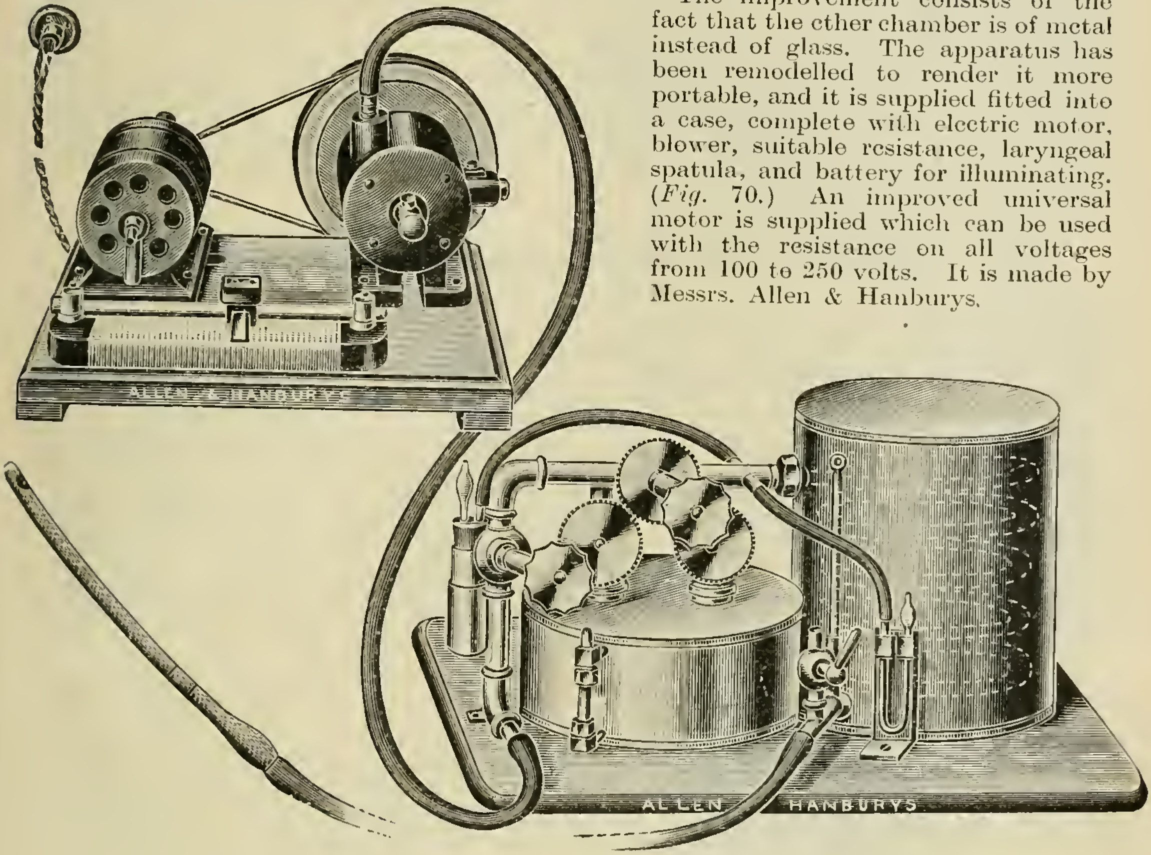


*Fig.* 70.

**Intratracheal Medication (A Tube for).**—As in cases of influenza there is frequent involvement of the larynx, trachea, and bronchi, Dr. A. R. Friel thinks that medical men may be interested to be referred to the method recently devised by Professor Leduc, of Nantes, for the introduction of medicated oily fluids into the trachea by the patient himself, as illustrated in the diagram (*Fig.* 71). It is simple and efficacious. Half a teaspoonful of oil of almonds containing 1 per cent of menthol or 1 per cent of phenol, or both combined, is poured into the wide curve of the glass tube; the short curve is placed far back in the pharynx, the lips are tightly closed round the stem, and

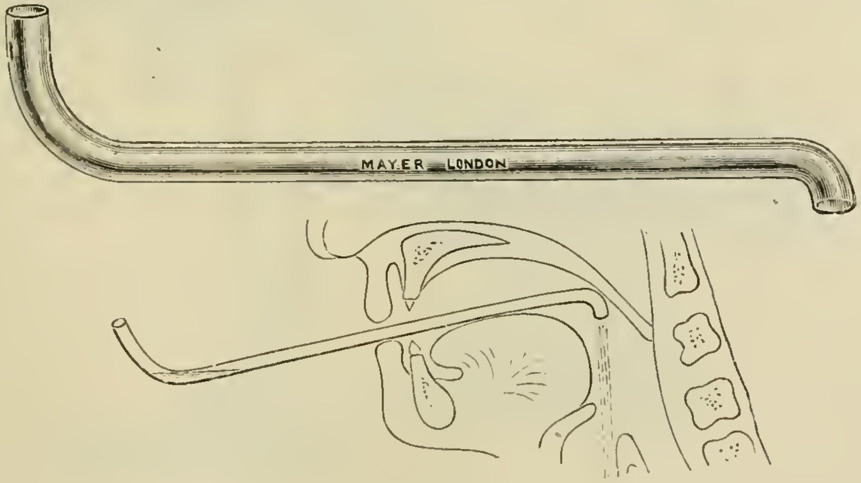


*Fig.* 71.

an inspiration is made through the tube. This carries the fluid into the trachea. Each dose can be repeated twice or thrice at a time, and the treatment carried out four or five times daily. No coughing is caused. The tubes can be obtained from Messrs. Mayer & Phelps, New Cavendish Street, W.1.

**Irrigator (Anterior Chamber).**—The illustration (*Fig.* 72) shows an irrigator for the anterior chamber devised by Lieut.-Colonel E. A. R. Newman, and described by him in his recent book, *Irrigation in Cataract Extraction.* The nozzle is similar to that devised by M'Keown. The novelty of the apparatus lies in the fenestrated tubular metal handle, which allows the operator to place a finger and thumb on the tubing which conveys the fluid to the nozzle. By regulating the pressure at this point the impulse of the fluid is directly under the control of the operator. (Messrs. Down Bros. Ltd., London, S.E.1.)

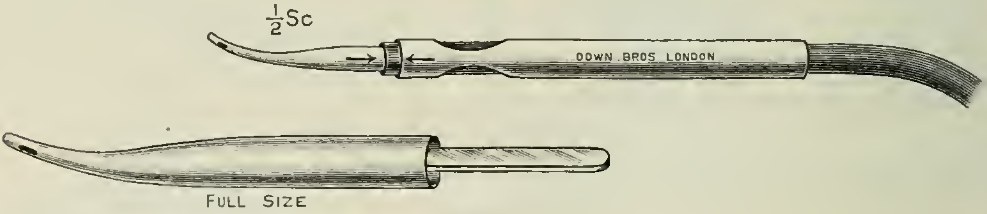


*Fig.* 72.

**Lamp for Examination.**—Under the name 'Cleerlite' Messrs. Allen & Hanburys have produced a form of lamp which, when connected with the electric supply, will give a perfectly clear beam without shadow.

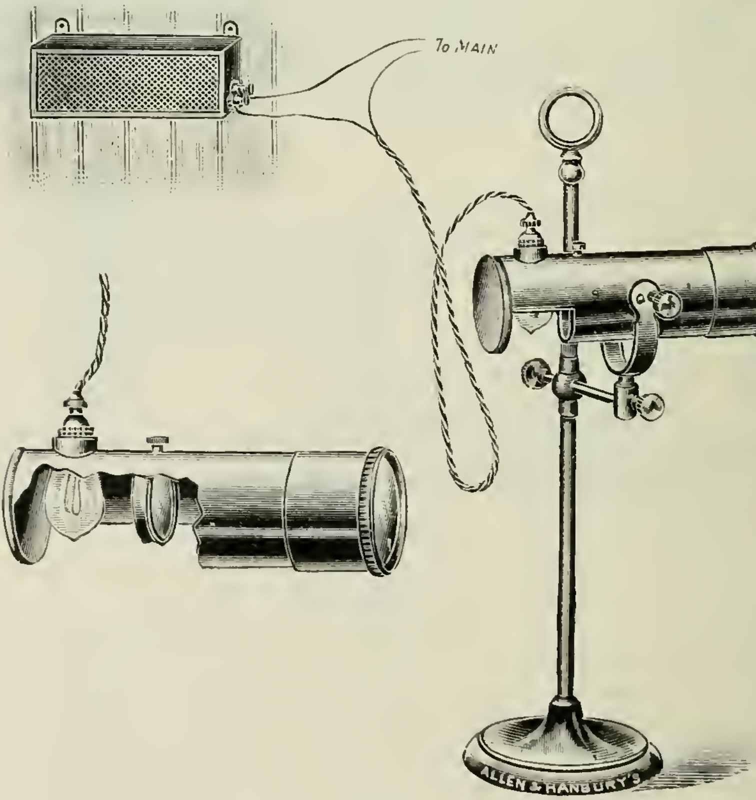


*Fig.* 73.

It is important that only lamps of the special type supplied with the apparatus should be used. It can be employed fitted to an ordinary floor standard or as a table lamp. The general construction will be understood from the illustration (*Fig.* 73).

**Lamp ("The Adjustolite").**—This is one of the most useful things a practitioner can possess, because it enables a brilliant illumination to be obtained in any possible position. By its clip it is possible to fasten it in most places, and then it can be rotated or fixed at any angle, for any purpose which may be required. Messrs. R. Sumner & Co. send us this appliance (*Fig.* 74), which only costs 20s. without bulb.

**Laryngeal Mirror of Stainless Steel.**—In view of the desirability both of warming and boiling a laryngeal mirror, the manufacture of laryngeal mirrors in optically polished stainless steel at a price which compares favourably with those made in glass will, we feel sure, be welcomed by the general practitioner and laryngologist. The mirrors (*Fig*, 75), which can be supplied in six sizes, are made by Messrs. Down Bros. Ltd., London. S.E.1, who supply a handle which allows the mirrors to be fixed in different positions for laryngeal and post-nasal use.

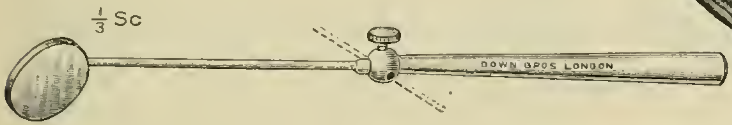


*Fig.* 75.

PAT U S A CANADA AND FOREIGN COUNTRIES

*Fig.* 74.

**Microscope (The Davon Super).**—The 'Davon' Super Microscope (*Fig.* 76) is a distinct departure from what are considered to be the orthodox and unalterable principles upon which a microscope is constructed and the objective employed. By means of a lens system placed behind the objective an image of the object is projected, and this aerial image is magnified by the objective and eyepiece acting as a compound eyepiece.

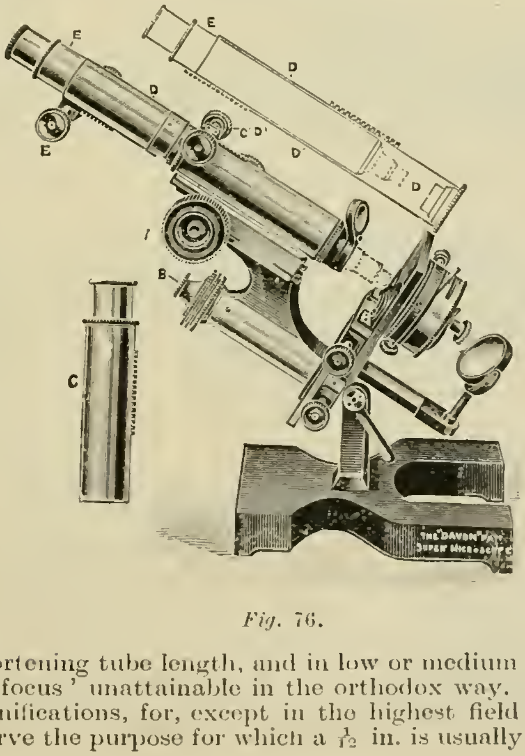


*Fig.* 76.

It has the effect of shortening tube length, and in low or medium magnification provides a field and 'depth of focus' unattainable in the orthodox way. It solves the problem of high eyepiece magnifications, for, except in the highest field of critical research, a good $\frac{1}{6}$ in. O.G. will serve the purpose for which a $\frac{1}{12}$ in. is usually employed. It enables one to use higher magnification on any given O.G. than the N.A. law is supposed to permit, and this *without losing resolution*—a most important point.

We have seen a number of microphotographs taken with this instrument, and they excel anything which would be possible with an ordinary microscope.

Messrs. F. Davidson & Co., 29, Great Portland Street, London, W.1.

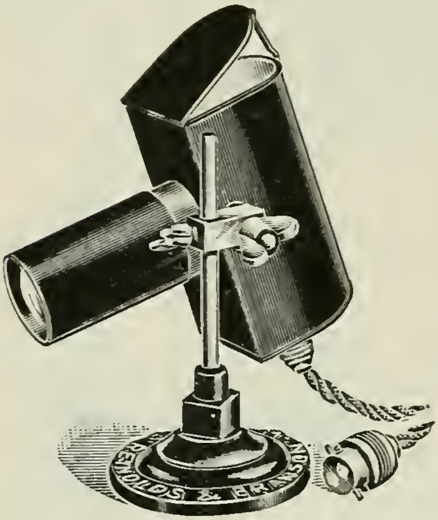


*Fig.* 77.

**Microscope Lamp ('Rystos').**—This is supplied at the same price fitted for either electric globe or incandescent gas mantle. It can be raised, lowered, or tilted to any required angle, and can also be used as a lecturer's reading lamp. The price complete, with 2¼-in. plano-convex condensing lens in focusing mount with 6 feet of flexible cord and bayonet plug (*Fig.* 77), is £1 7s. 6d. (Messrs. Reynolds & Branson, Leeds.)

**Needle-holder with Side Spring Release.**—This is a distinct advantage over the ordinary pattern which has a ratchet arrangement at the base. In the latter, to open the holder the sides have first to be drawn closer together, thereby compressing the needle, which is liable to break under the pressure. In this one, all that is necessary is to press the spring release, which instantly opens the holder, thus not only avoiding breaking the needle, but being much quicker in operation.

It is sent to us by Messrs. R. Sumner & Co., Liverpool, and costs 16s.

**Ophthalmic Instruments.**—The illustrations (*Figs.* 78 and 79) show two new instruments which may prove of interest to those who do ophthalmic surgery. The double curved clip forceps are used for clamping the optic nerve and neighbouring vessels in enucleation operations before severing the posterior attachments of the globe. It is claimed that its use gives a dry orbit and reduces reaction due to hæmorrhage to a minimum.

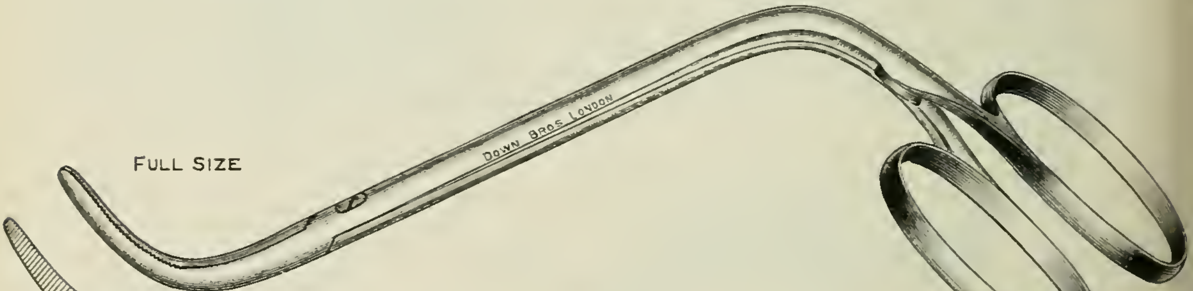


*Fig.* 78.

The single-catch needle-holder is made on the lines of a Mayo needle-holder. With its use small needles can be picked up, introduced, released, re-gripped, and pulled through with rapidity and ease. It is not severe on needles if properly used.

They have been made to the design of Major R. E. Wright, I.M.S., by Messrs. Down Bros. Ltd., London.

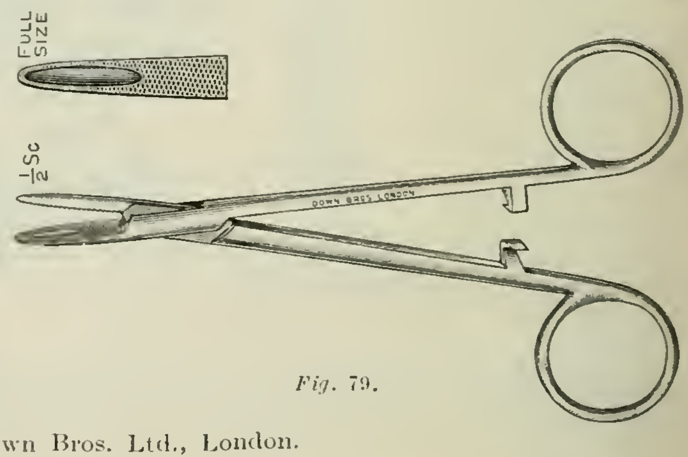


*Fig.* 79.

**Pantoscope ('The Holborn').**—The illustration (*Fig.* 80) shows a new electrical examination set which has been brought out by The Holborn Surgical Instrument Co. Ltd., at a very reasonable price.

The set consists of a dry cell in a neat metal pocket case, a pair of connecting cords, an aural speculum, a throat mirror, an electric torch, with fitting to take same, and one electric torch with tongue depressor attachment. The price complete in case is 15s. spare batteries 1s. each, and spare bulbs 9d.

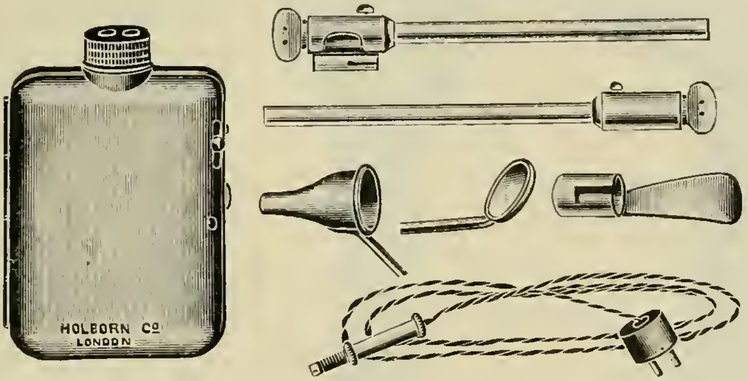


*Fig.* 80.

We have carefully examined and tested the appliance, and find that in spite of its moderate price it is well made and most efficient. We can strongly recommend it.

**Phonosphygmometer.**—Dr. C. Lian's apparatus (*Fig.* 81) makes use of the auscultatory method, with the following advantages :—

1. Light and flexible armlet which can be put on either a very slim arm or a very big thigh.
2. Aneroid manometer permanently connected with the upper edge of the armlet.
3. Vibrating membrane fixed by a bracelet independent of the armlet in a rubber setting which can mould itself on the limb.

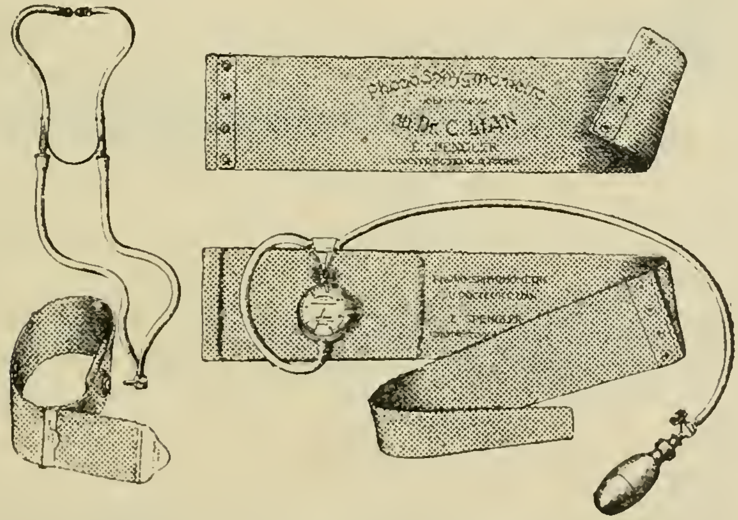
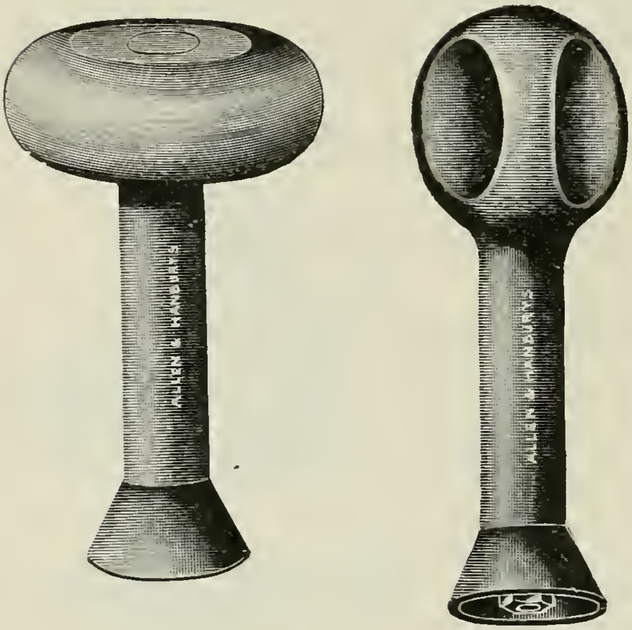


*Fig.* 81.

4. Binaural stethoscope connected with the exploratory piece by a movable right-angled articulation, a feature which is very advantageous.
5. The apparatus is very handy ; it fits easily into two jacket pockets, or it can be carried in the hand when placed in a leather bag about 4½ in. by 7 in.
6. Owing to the construction of the armlet and the vibrating membrane, the practitioner is able to measure the blood-pressure in the femoral artery as well as in the arteries of the forearm and leg.

It is manufactured by M. E. Spengler, 16 rue de l'Odéon, Paris, and costs fr. 175.

**'Prolapsuport'.**—We all meet with cases of uterine prolapse where the ordinary pessary fails. The one we illustrate (*Fig.* 82) is designed to meet such cases and has proved efficient. It has the advantage of being so constructed that the patient can insert it or withdraw it herself. It is called the 'Prolapsuport', and the cost is 25s. Messrs. Allen & Hanburys Ltd., are the makers.



EXPANDED CONTRACTED

*Fig.* 82.

**Prostatic Instruments.**—Mr. James MacMunn writes: "The large massaging bulb (*Fig.* 83)—as large as the anal canal will admit with comfort—presses the secretions from the prostatic ducts, and at the same time aids the circulation of the hæmorrhoidal plexus and the prostate, and, higher up, the circulation of the vesico-prostatic plexus, which the finger cannot do. With this massage there is combined [a strong stream of hot saline water, followed if desired by cold, upon the surface of the prostate. Thus we have a means of alleviating congestion, resolving the inflamed tissue, and increasing muscular tone.

The second instrument (*Fig.* 84) represents a useful addition to prostatic massage which must be used only by the surgeon. It is a long flat sound, as broad as the urethra will admit (I use three sizes), ending in a large bulb. The prostate is massaged against the convexity of the instrument. Hitherto Kollman's dilators were supposed to afford the best means of opening and emptying the ducts of the urethra, which is the chief consideration in the treatment of gleet: but, while this dilator can open follicles, it certainly cannot empty them, nor can suction. In my opinion the only way to empty follicles is to massage them over flat sounds, preferably by means of a rubber roller.

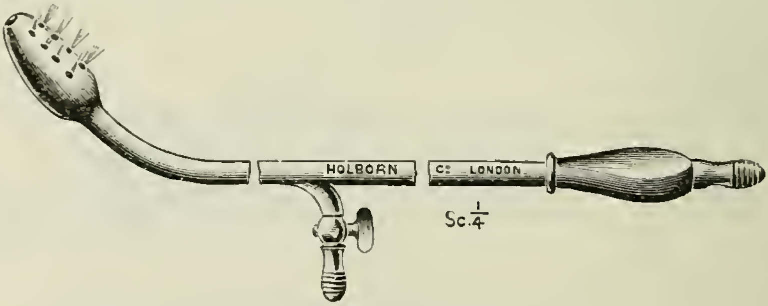


*Fig.* 83.

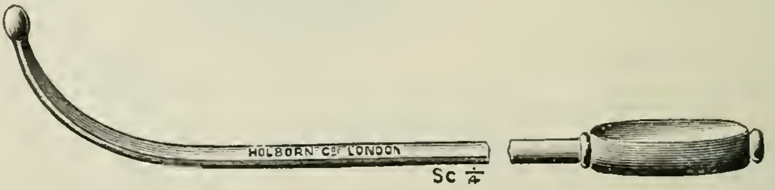


*Fig.* 84.

(The Holborn Surgical Instrument Co. Ltd.)

**Retractor.**—Dr. Fred. Smith, of Aberdeen, has designed this retractor (*Fig.* 85) for gall-bladder and kidney operations. Its purpose is to hold back the liver efficiently and expose the gall-bladder in the central fenestra. The makers are Messrs. Down Bros, Ltd., London, S.E.1.

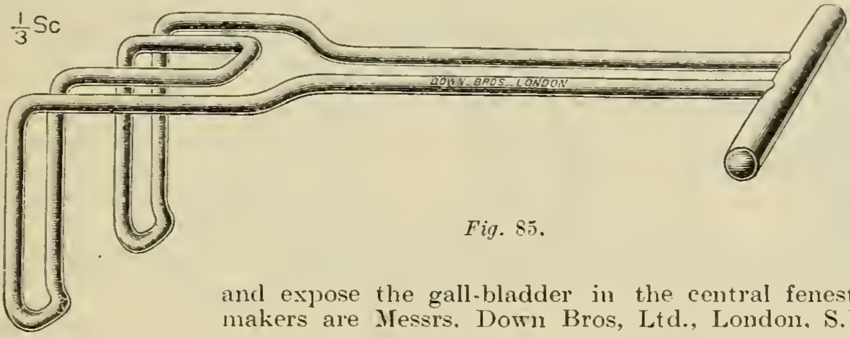


*Fig.* 85.

**Rustless Steel (Instruments of).**—The Holborn Surgical Instrument Co. Ltd. now stock instruments of rustless steel.

The scissors illustrated (*Fig.* 86) are 5¾ in. long, and are made with ordinary size bows and also with extra large bows, and with straight or curved blades, and the usual variety of points.

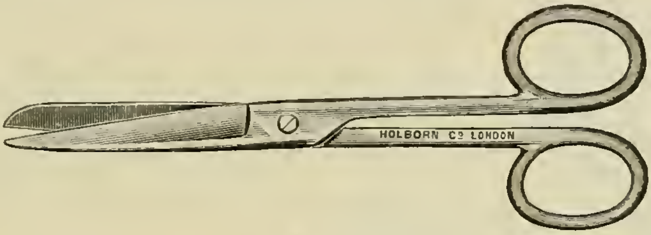


*Fig.* 86.

The curette (*Fig.* 87) is made in one piece, 11½ in. long and ⅜ in. wide at the point:

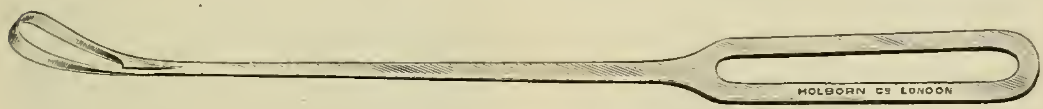


*Fig.* 87.

These instruments are guaranteed to be rustless, and are not very much more expensive than those made of ordinary steel.

**Scissors (Rustless).**—Messrs. Reynolds & Branson, Leeds, now supply these in the angled-on-flat ’ type (*Fig.* 88) in two sizes, and also the ordinary straight type, at reasonable prices.

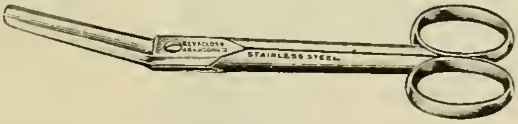


*Fig.* 88.

**Slumber Mats.**—Dr. Marcus Paterson suggests a grass mat placed over the mattress as a means of preventing night sweats. These are supplied by Messrs. Mayer & Phelps, New Cavendish Street, W.1. They are of full size, well made, and durable. Quite apart from their curative properties, they are very hygienic as a protection to the mattress. A sample may be obtained, post free, for 5s. 6d.

**Sterilizer Drums.**—An improved type is now supplied by Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1, in various sizes to meet all requirements.

**Stomach Tube for Fractional Analysis.**—This tube (*Fig.* 89) is a modification, designed by Dr. John A. Ryle, of the Einhorn tube for fractional gastric analysis. The weighted end designed to facilitate swallowing is covered with rubber, and therefore avoids the possibility of slight trauma to the gastric mucosa which sometimes takes place when strong suction is exerted through a metal bulb on an almost empty stomach. The makers are Messrs. Down Bros. Ltd., London. S.E.1.

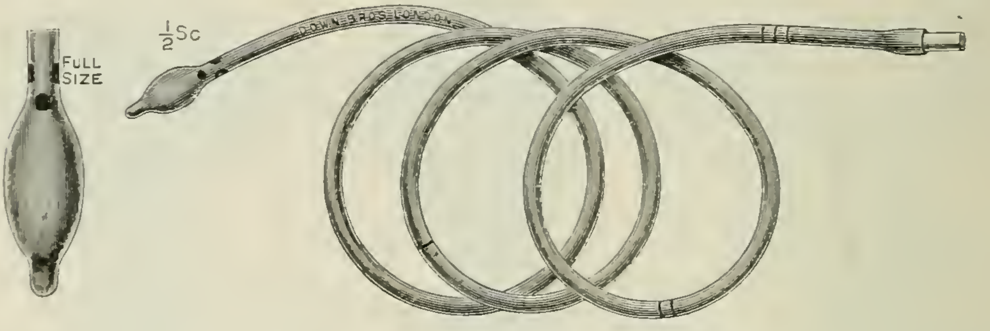


*Fig.* 89.

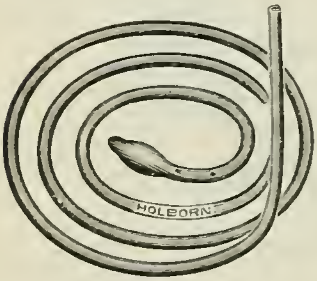


*Fig.* 90.

*Ryle's Stomach Tube for Fractional Analysis* (*Fig.* 90).—This is made of a small gauge (6 English catheter). It has a weighted tip which the patient can swallow naturally and retain for some time, and specimens can be extracted from the duodenum by means of an ordinary glass syringe made with a nozzle which fits into the open end of the tube. (The Holborn Surgical Instrument Co. Ltd.)

**Syringe (Glass, with Metal Nozzle).**—We have always objected to the all-glass syringe because the nozzle so easily chips and the syringe is rendered useless. Messrs. R. Sumner & Co. Ltd., Liverpool, have now sent us one in which this objection has been removed by a metal nozzle, which we think will prove durable in ordinary use. It costs 4s. 6d.

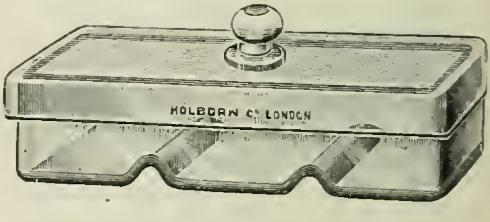


*Fig.* 91.

**Syringe Box.**—This is a glass box (*Fig.* 91), 5½ × 2½ × 1½ in., useful for keeping hypodermic syringes in a solution. It costs 3s. 6d. (The Holborn Surgical Instrument Co. Ltd.)

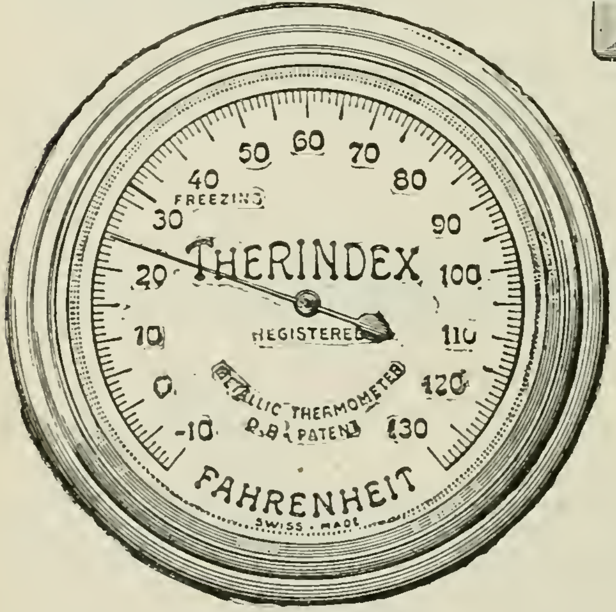


*Fig.* 92.

**'Therindex.'**—This is an instrument for accurately determining the temperature. It is mounted in a handsome round metal case, outside diameter 3 in., thickness ⅝ in., with lug at back for hanging. The silvered metal dial (*Fig.* 92) is clearly figured in black, graduated from 42° below freezing point to 130 F. It is made on entirely new scientific principles and actuated by a specially constructed metal spiral spring. We have tested this carefully, and find it most reliable and sensitive. (Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.)

**Thoracoscope.**—The instrument illustrated here (*Fig.* 93) is similar to a cystoscope, and has been devised for inspection of the lung through the chest wall; also to enable adhesions to be broken down with the electric cautery to obtain pneumothorax. Messrs. Allen & Hanburys are the manufacturers.

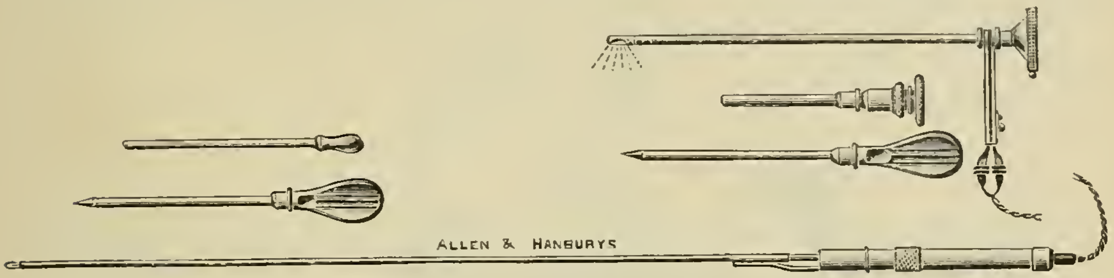


*Fig.* 93.

**Torch (Safety Electric),**—This model (*Fig.* 94) represents quite a new idea in the construction of pocket electric torches. The end cap is held friction tight in the battery container as shown in the illustration. When the light is required, it is only necessary to remove the end cap, reverse it, and replace it in the tube, and reverse the operation when the light is no longer required. When the torch is not in use, the bulb is protected from injury and acts as an insulator to the battery, making it impossible for the current to be used up accidentally or short-circuited. There is no switch to get out of order or make accidental contact, nor are there any sharp edges likely to injure the lining of the pocket. Although the safety torch is small and compact, the battery will be found to yield considerable service before requiring renewal. Price 3s. complete from Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.

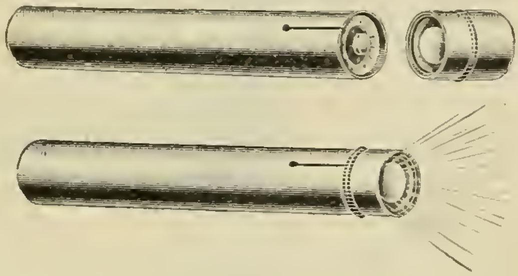


*Fig.* 94.

**Tractor for Midwifery Forceps.** — This differs from Le Page's tractor in the fact that the force is exerted on the shanks of the forceps (*Fig.* 95) instead of on the handles. Dr. Farmer, who has designed it, finds that this gives greater security and efficiency. It is made by Messrs. Mayer & Phelps.

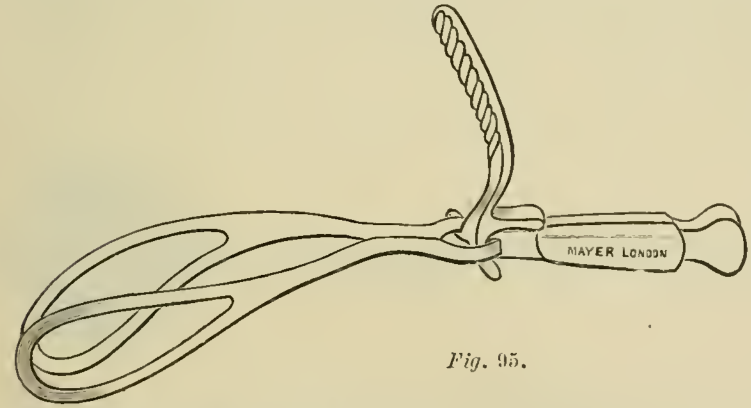


*Fig.* 95.

**Urea in Blood (Test for),**—Mr. J. H. Ryffel, of Guy's Hospital, has designed a simple apparatus (*Fig.* 96) for Ambard's method of determining percentage of urea in blood. It is made by Messrs. Down Bros. Ltd., London, S.E.1, and full directions for use accompany each apparatus.

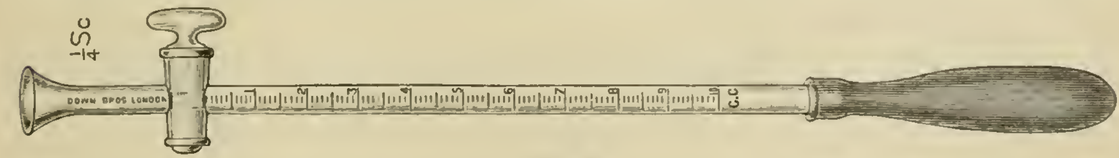


*Fig.* 96.

**Urethroscope (A New).**—The urethroscope illustrated (*Fig.* 97) has been designed to meet the latest demands for examining and operating on the urethra.

Its principal features consist of a simple method for focusing light in order to obtain intensified illumination, which is carried to the extreme end of the tube. There is an air-regulator in place of the ordinary stopcock, with fine adjustment for regulating the amount of air passing into or held in the urethra.

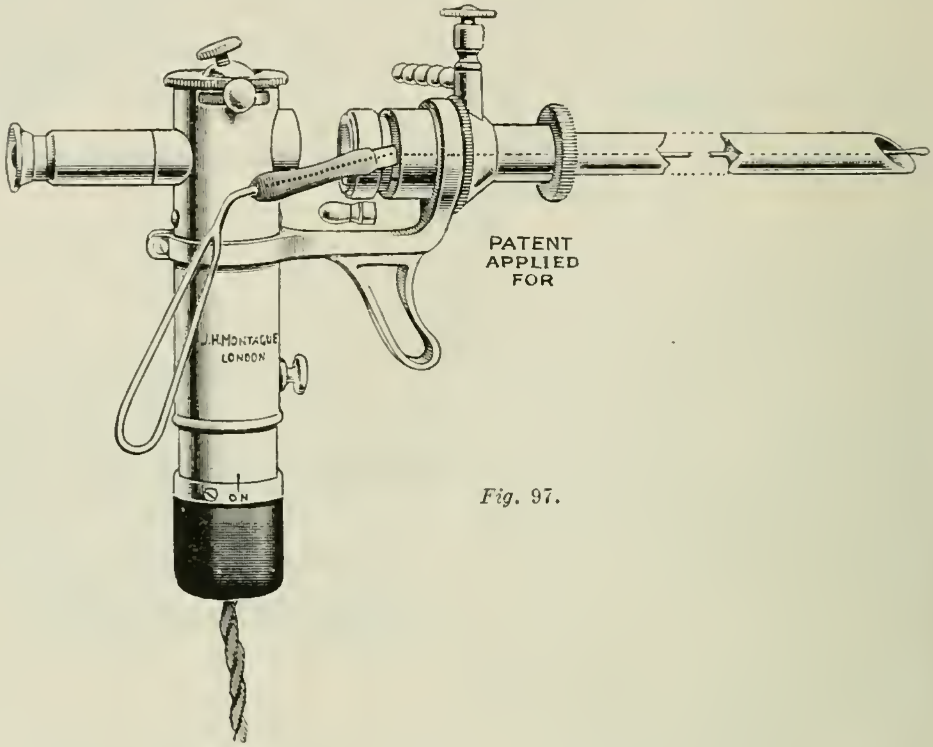


*Fig.* 97.

Instruments are passed through the side of the nozzle without impeding the full field of vision, and are under the direct control of the operator.

Extreme lightness is a great advantage of this instrument, which is also very compact, and is supplied with probes, cannula, and obturators complete in case by Mr. J. H. Montague, 69, New Bond Street, W.1.

**Vacuum Bougies.**—The illustrations (*Figs.* 98 and 99) show fenestrated bougies for use in the cervix uteri, and also female urethra, to remove secretions by suction for diagnostic purposes. They are a modification of the well-known suction bougies for the treatment of gonorrhœa by negative pressure, and have been made for Dr. Claude H. Mills by Messrs. Down Bros. Ltd., London, S.E.1.

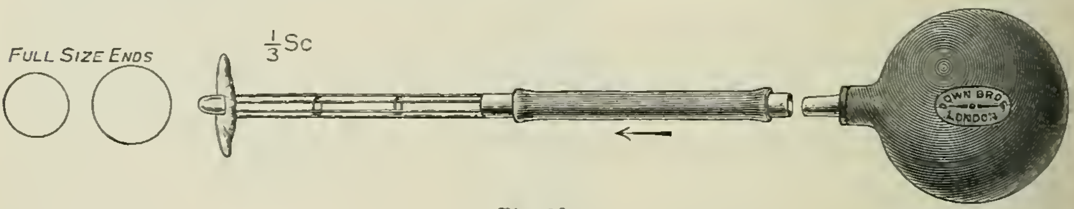


*Fig.* 98.

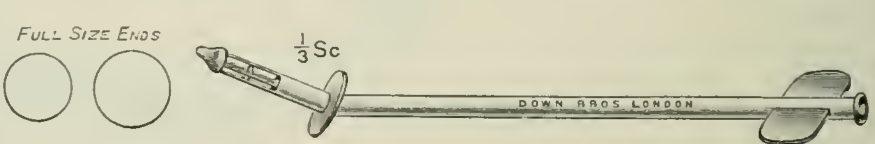


*Fig.* 99.

**Vaginal Retractor** (**Jayle's.**—The illustration (*Fig.* 100) represents a very efficient instrument; it is made with a rack and pinion, and opens parallel like a Gossett's retractor. (The Holborn Surgical Instrument Co. Ltd.)

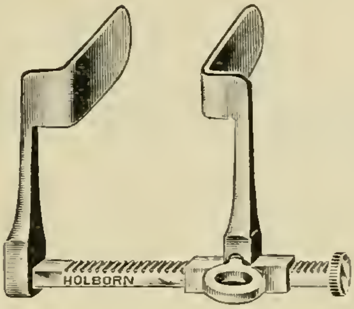


*Fig.* 100.

**Vein-holding Forceps.**—The Holborn Surgical Instrument Co. Ltd. have recently brought out a most useful forceps for facilitating the introduction of a needle into a vein. Few medical men will have failed to experience the difficulty of inserting a needle into a loose and slipping vein. By means of the forceps illustrated (*Fig.* 101) the vein can be held in position and the needle easily inserted. This forceps will prove a great help to those who have had no experience in intravenous injections.

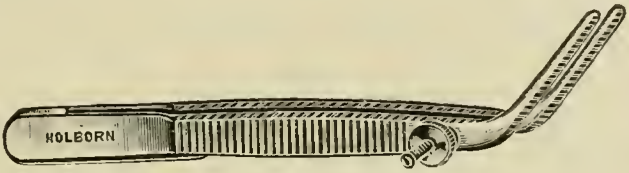


*Fig.* 101.

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**Ayr.**—*District Asylum,* Glengall. Med. Supt., G. Douglas McRae, M.D., F.R.C.P. Ayr station, 2 miles.

**Ballinasloe (Co. Galway).**—*Ballinasloe Mental Hospital.* Res. Med. Supt., John Mills, M.B. Ballinasloe station, 2 miles.

**Banff.**—*District Asylum,* Ladysbridge. Res. Supt., J. Chisholm. Vis. Phys., Wm. Fergusson, M.D. Ladysbridge station.

**Baschurch (Shropshire).** — *Boreatton Park,* 10 miles from Shrewsbury. Res. Med. Supt., Dr. E. H. O. Sankey. Baschurch, 2½ miles. *See also Advt., p.* **91**

**Bath.**—*Bailbrook House.* Res. Med. Supt., Norman Lavers, M.D. Bath, 10 minutes' drive. *See also Advt., p.* **97**

**Bedford.**—*Bishopstone House* (for 18 ladies). Prop., Mrs. B. Peele. Med. Off., Dr. A. Chillingworth.

*Springfield House Mental Hospital,* near Bedford. 1 hour from London. Better class only received. Separate bedrooms. Ordinary terms 5 guineas. Res. Med. Supts., David Bower and Cedric W. Bower. Bedford, 1½ miles, L.M. & S.R. Tel. No. 17. *See also Advt., p.* **97**

**Belfast.**—*Belfast District Lunatic Asylum.* Res. Med. Supt., Dr. S. J. Graham.

**Beverley.**—*East Riding of Yorkshire County Mental Hospital.* Res. Med. Supt., E. S. Simpson, M.C., M.D. Beverley station, 2 miles.

**Birmingham.**—*Rubery Hill and Hollymoor Mental Hospital.* Res. Med. Supt., T. C. Graves, M.D. Rubery station.

*Birmingham City Mental Hospital,* Winson Green. Res. Med. Supt., Dr. C. B. Roscrow. Winson Green, ½ mile; Soho, ¼ mile.

**Bodmin.**—*Cornwall County Mental Hospital.* Res. Med. Supt., Dr. Francis Dudley. Bodmin station, G.W.R. and S.R.

**Box (Wilts.).**—*Kingsdown House,* 5 miles from Bath. Res. Med. Supt., Dr. H. C. MacBryan. *See also Advt., p.* **92**

**Brentwood.**—*Brentwood Mental Hospital.* Res. Med. Supt., W. Robinson, M.D. Brentwood station, ½ mile.

*Littleton Hall,* Brentwood, Essex (for ladies). Med. Licensee, Dr. H. E. Haynes. Brentwood and Shenfield, 1¼ miles.

**Bridgend.**—*Glamorgan County Mental Hospital.* Res. Med. Supt., D. Finlay, M.D. Bridgend, 1½ miles.

**Bristol (near).** — *Brislington House.* Proprietress, Mrs. Bonville Fox. Res. Physician, Dr. J. M. Rutherford. Bristol, 3 miles. *See also Advt., p.* **95**

*Bristol Mental Hospital,* Fishponds. Res. Med. Supt., J. Vincent Blachford, M.D. Clerk and Steward, A. W. King, Fishponds station, 1 mile.

*Northwoods House,* Winterbourne, 7 miles from Bristol. Res. Med. Prop., J. D. Thomas, B.A., M.B., B.C. Taxicab from Bristol, Fishponds, Winterbourne, or Patchway stations. *See also Advt., p.* **98**

**Bromsgrove (Worcs.).**—*Worcestershire Mental Hospital, " Barnsley Hall ".* Res. Med. Supt., Dr. P. T. Hughes. Bromsgrove, L.M. & S.R. 2½ miles. *See also Advt., p.* 95

**Burgess Hill (Sussex).**—*St. George's Retreat.* Licensee. Miss Mary Doran. Med. Supt., Dr. R. D. Pennefather. Wivelsfield, 1½ miles; Burgess Hill station, 2 miles. *See also Advt., p.* 101

**Burley-in-Wharfedale (Yorks.).**—*West Riding Asylum,* Scalebor Park. Res. Med. Supt., Dr. J. R. Gilmour. Burley-in-Wharfedale station, L.M. & S.R., ¼ mile.

**Bury, (Lancs.).**—*Oaklands,* Walmersley, (for ladies). Res. Med. Supt., Dr. Philip G. Mould.

**Buxton.**—*Wye House.* Res. Med. Supt., W. W. Horton, M.D. Buxton, L. & N. W.R. and L.M. & S.R., 10 minutes. *See also Advt., p.* 100

**Caerleon (Mon.).** — *Newport Borough Asylum.* Res. Med. Supt., W. F. Nelis, M.D. Caerleon, ¼ mile.

**Cambridge.**—*County Mental Hospital.* Fulbourn. Res. Med. Supt., Dr. M. A. Archdale. Cambridge station, 3 miles.

**Canterbury.**—*Stone House,* St. Martin's. Res. Med. Supt., Dr. E. F. Sall. Canterbury East.

**Cardiff.**—*Cardiff City Mental Hospital,* Whitchurch. Res. Med. Supt., E. Goodall, C.B.E., M.D. Llandaff, G.W.R., 1 mile.

**Carlisle.**—*Cumberland & Westmorland Mental Hospital.* Res. Med. Supt., W. F. Farquharson, M.D. Carlisle, 3 miles.

**Carlow.**—*District Asylum.* Res. Med. Supt., Dr. T. A. Greene. Carlow, ¼ mile.

**Carmarthen.**—*Joint Counties Mental Hospital.* Res. Med. Supt., J. Richards, F.R.C.S.E. Carmarthen, 2 miles.

**Castlebar (Co. Mayo).**—*Co. Mayo Mental Hospital.* Res. Med. Supt., F. C. Ellison, M.D. Castlebar, 1 mile.

**Chartham (near Canterbury).**—*Kent County Mental Hospital.* Res. Med. Supt., M. A. Collins, M.D. Chartham, 1 mile; Canterbury, 3 miles.

**Cheadle (Cheshire).** — *Cheadle Royal Mental Hospital.* Res. Med. Supt., J. A. C. Roy, M.B., ChB. Heald Green, 1 mile. *See also Advt. p.* 94

**Chester.**—*Cheshire County Mental Hospital.* Res. Med. Supt., G. Hamilton Grills, M.D. Chester station, 1½ miles.

**Chichester.**—*West Sussex Mental Hospital,* Graylingwell. Res. Med. Supt., Dr. H. A. Kidd, C.B.E. Chichester station, 1½ miles. *See also Advt., p.* 101

**Church Stretton.** — *Stretton House,* Shropshire (for gentlemen). Med. Supt., Dr. A. A. Watson, C.M.G., D.S.O. Res. Med. Off., Dr. — — —. Church Stretton station, ¼ mile. *See also Advt., p.* 93

*The Grove House,* All Stretton, Shropshire (for ladies). Res. Prop. and Med. Supt., Dr. J. McClintock.

**Clonmel.**—*District Mental Hospital.* Res. Med. Supt., Dr. Bagenal C. Harvey. Clonmel, 1 mile.

**Colchester.**—*Essex and Colchester Mental Hospital,* Severalls. Res. Med. Supt., Dr. R. C. Turnbull. Colchester, 1½ miles.

**Cork.**—*Cork District Mental Hospital.* Res. Med. Supt., Dr. O. F. McCarthy. Cork, 2½ miles.

*Lindville,* Cork. Res. Med. Props., Dr. C. A. P. Osburne and Dr. J. C. Osburne.

**Cupar (Fifeshire).**—*Fife and Kinross District Asylum.* Res. Med. Supt., James H. Skeen, M.B. Springfield station, N.B.R., ¾ mile.

**Darlington (Durham).**—*Middleton Hall,* Middleton St. George. Res. Med. Supt., L. Harris-Liston, M.D. Dinsdale station, 1 mile.

**Dartford (Kent).**—*City of London Mental Hospital,* near Dartford. Res. Med. Supt., Dr. R. H. Steen. Dartford, S.E.R., 2 miles.

**Denbigh (North Wales).**—*North Wales Counties Asylum.* Med. Supt., Frank G. Jones, M.D. Denbigh, 1 mile.

**Derby.** — *Borough Mental Hospital,* Rowditch. Res. Med. Supt., Dr. John Bain. L. & N.E.R. station, 1 mile; L.M. & S.R., 2 miles. *See also Advt., p.* 96

*The County Asylum,* Mickleover, Derby. Res. Med. Supt., Dr. G. N. Bartlett, Derby, L.M. & S.R., 5 miles; Mickleover. L. & N.E.R., 2 miles.

**Devizes.**—*Wilts County Asylum.* Res. Med. Supt., S. J. Cole, M.D. Devizes, 1 mile.

**Dorchester.**—*Dorset Mental Hospital.* Res. Med. Supt., G. E. Peachell, M.D. Dorchester, 3 miles.

**Downpatrick.**—*Down District Asylum.* Res. Med. Supt., M. J. Nolan, L.R.C.P.I. and L. M. Downpatrick, 1 mile.

**Dublin.**—*Bloomfield,* Morehampton Rd. Med. Off., H. T. Bewley, M.D. Dublin, 1 mile.

*Elm Lawn,* Dundrum, Co. Dublin (ladies). Prop., Miss Bernard. Vis. Phys., Dr. A. S. Goff.

*Farnham House* and *Maryville,* Finglas, Dublin. Res. Med. Supt., H. P. D'Arcy Benson, M.D. Cab from Dublin, 2 miles.

*Highfield* (for ladies), Drumcondra; *Hampstead* (for gentlemen), Glasnevin. Res. Med. Supts., Hy. M. Eustace, B.A., M.D., and Wm. N. Eustace, L.R.C.P.I. & S.I. By rail, Dublin. *See also Advt., p.* **93**

*House of St. John of God*, Stillorgan, Dublin. Res. Phys., Dr. J. J. Boland. Stillorgan station, ½ mile.

*Richmond District Asylum*, Dublin. Res. Med. Supt., Dr. J. O'Conor Donelan; also *Richmond District Asylum (Portrane Branch)*, Donabate, Dublin. Dep. Med. Supt., Miss E. L. Fleury, M.D. Donabate station, 1 mile.

*St. Patrick's Hospital*, James's Street, Dublin. Res. Med. Supt., Dr. R. R. Leeper. Branch Asylum, *St. Edmondsbury*, at Lucan. *See also Advt., p.* **88**

*St. Vincent's Asylum*, Fairview, Dublin. Vis. Physicians, John Murphy, F.R.C.P.I., and F. X. Callaghan, F.R.C.P.I. Apply to the Superioress.

*Stewart Institution*, Palmerston, Chapelizod, Co. Dublin. Res. Med. Supt., F. E. Rainsford, M.D. Kingsbridge, 2½ miles.

*Verville*, Clontarf, near Dublin. Prop., Dr. P. D. Sullivan.

**Dudley (Stafford).**—*Ashwood House*, Kingswinford. Props., Drs. Peacock and Pietersen. Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge Junc., 3½ miles; Dudley station, 4 miles; Wolverhampton, 7 miles. Tel.: 19 Kingswinford. *See also Advt., p.* **98**

**Dumfries.**—*Crichton Royal.* Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

**Dundee.**—*Baldovan Institution* (for the treatment and education of the feeble-minded). Res. Med. Supt., W. B. Drummond, F.R.C.P.E. Downfield, 1 mile; Dundee, 4½ miles.

*Dundee District Asylum*, Westgreen, Dundee. Res. Med. Supt., W. Tuach-Mackenzie, M.D. Dundee, 3 miles; Liff, 1½ miles.

*Dundee Royal Asylum, Gowrie House*, Dundee. Med. Off., A. B. Dalgetty, M.D. Sec., J. Wilkie, 20, Reform Street, Dundee.

**Durham.**—*County Asylum*, Winterton. Res. Med. Supt., Dr. H. G. Cribb. Sedgefield station, 2¾ miles, by bus.

*Gateshead County Borough Mental Hospital*, Stannington, Newcastle-on-Tyne. Res. Med. Supt., Lt.-Col. J. V. G. B. Tighe, M.B. Stannington N.E.R., 2½ miles.

*Sunderland Borough Mental Hospital*, Ryhope, Durham. Res. Med. Supt., Dr. M. A. Archdale. Ryhope station, 1 mile.

**Edinburgh.**—*Edinburgh District Asylum*, Bangour Village, West Lothian. Res. Med. Supt., J. Keay, M.D. Uphall, N.B.Rly., 2 miles.

*Midlothian and Peebles District Asylum.* Res. Med. Supt., James H. C. Orr, M.D. Rosslynlee, 1 mile; Edinburgh, 12 miles.

*New Saughton Hall*, Polton, Edinburgh, Res. Med. Supt., S. R. Macphail, M.D., Edin. Polton, 5 minutes; Loanhead, 10 minutes' walk. *See also Advt., p.* **90**

*Royal Edinburgh Asylum*, Morningside. Res. Phys. Supt., Professor George Robertson. Edinburgh, 1½ miles.

**Elgin.**—*Morayshire District Asylum.* Res. Supt., Miss Annie A. Kinloch. Vis. Med. Off., Dr. D. G. Campbell. Elgin, 1¼ miles.

**Ennis.**—*Clare Mental Hospital.* Res. Med. Supt., Dr. F. O'Mara. Ennis, 2 miles.

**Enniscorthy (Co. Wexford).**—*District Lunatic Asylum.* Res. Med. Supt., Dr. H. T. J. Kennedy. Enniscorthy, 1 mile.

**Epsom (Surrey).**—*The Silver Birches*, Church Street (for ladies). Licensees, Miss Daniel (Res.), Dr. E. G. C. Daniel. L. & S.W.R. and L.B. & S.C.R., 5 minutes. Tel.: 346 P.O. Epsom. *See also Advt., p.* **100**

**Exeter.**—*City Mental Hospital*, Digbys, Heavitree. Res. Med. Supt., — — — Exeter, 3 miles. *See also Advt., p.* **99**

*Court Hall*, Kenton, near Exeter. Res. Licensees, Miss Mules, M.D., B.S., and Miss A. S. Mules, M.R.C.S. Starcross, 1 mile.

*Devon Mental Hospital*, Exminster. Res. Med. Supt., Richard Eager, O.B.E., M.D. Exminster, 1¼ miles; Exeter, 4 miles.

*Wonford House Hospital for the Insane*, Exeter. Res. Med. Supt., W. B. Morton, M.D. Exeter station (Queen St.) 1½ miles; (St. David's), 2 miles.

**Fairford (Gloucestershire).**— *Fairford Retreat.* Res. Med. Supt. and Prop., Dr. A. C. King-Turner. Fairford, 1 mile.

**Fareham (Hants.).**—*Knowle Mental Hospital.* Res. Med. Supt., Dr. J. L. Jackson. Knowle, ⅛ mile.

**Glasgow.**—*District Mental Hospital*, Woodilee. Res. Med. Supt., H. Carre, L.R.C.P. & S. Lenzie station, 1 mile; Glasgow, 8 miles.

*Glasgow District Hospital for Mental Diseases*, Gartloch. Res. Med. Supt., W. A. Parker, M.B. Garnkirk station, 1 mile.

*Glasgow Royal Mental Hospital.* Gartnavel. Res. Med. Supt., D. K. Henderson, M.D.

*Govan District Asylum*, Hawkhead, Glasgow. Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

*Kirklands Mental Hospital*, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, ½ mile; Glasgow, 9 miles.

*Lanark District Asylum*, Hartwood, Lanarkshire. Med. Supt., Dr. N. T. Kerr. Hartwood station, ¼ mile.

*Smithston Asylum*, Greenock. Res. Med. Supt., Wm. Leggett, M.D. Greenock West, 1½ miles; Ravenscraig, ½ mile.

**Gloucester.** — *Barnwood House.* Res. Med. Supt., Arthur A. D. Townsend, M.D. Gloucester, 2 miles. *See also Advt., p.* **99**

*Gloucester County Mental Hospitals,* Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. J. Marnan. Gloucester station, 1 mile.

**Guernsey.**—*St. Peter Port Asylum.* Med. Off., E. K. Corbin. M.R.C.S.

**Haddington, N.B.**—*East Lothian District Asylum.* Supt., Miss Jean Sinclair. Med. Off., H. H. Robarts, M.D. Haddington station, 10 minutes.

**Hatton (near Warwick).**—*County Asylum.* Res. Med. Supt., A. Miller, M.B. Also *Leigh House,* for private patients. Hatton, G.W.R. station, 2 miles; Warwick, 3 miles.

**Haywards Heath.**—*Brighton County Borough Mental Hospital.* Res. Med. Supt., C. Planck, M.A., M.R.C.S. Haywards Heath, 1½ miles.

**Hellingly.**—*East Sussex County Mental Hospital,* near Eastbourne. Res. Med. Supt., F. R. P. Taylor, M.D., B.S. Hellingly, 1 mile. *See also Advt.. p.* **102**

**Henley-in-Arden (Warwickshire).**—*Glendossill* (for both sexes). Res. Med. Supt., Dr. W. Agar. Henley-in-Arden, G.W.R., ¾ mile.

**Hereford.**—*Hereford County and City Mental Hospital.* Res. Med. Supt., J. G. Smith, M.D. Barrs Court, G.W., L.M. & S., and L. & N.W.R., Hereford, 3 miles.

**Huddersfield (near).**—*West Riding Asylum,* "*Storthes Hall,*" Kirkburton. Res. Med. Supt., T. S. Adair, M.D. Kirkburton, L. & N.W.R., 1 mile.

**Hull.**—*City Asylum.* Res. Med. Supt., J. Merson, M.D. Willerby station, 1 mile; Hull, 6 miles.

**Inverness.** — *District Asylum.* Res. Med. Supt., T. C. Mackenzie, M.D. Inverness, 2½ miles.

**Ipswich.**— *Borough Mental Hospital.* Res. Med. Supt., Dr. W. M. Ogilvie. Ipswich, 2 miles.

**Isle of Man.**—*Mental Hospital,* Union Mills, Douglas. Res. Med. Supt., Leslie H. Skene, M.C., M.B., Ch.B. Union Mills, ½ mile.

**Isle of Wight.**—*The County Asylum,* Whitecroft. Res. Med. Supt., W. J. A. Erskine, M.D. Blackwater, ¾ mile; or Newport, 2½ miles.

**Isleworth (Middlesex).**—*Wyke House.* Res. Prop., Dr. F. Murchison. Isleworth, Brentford, and Osterley station, 1 mile.

**Ivybridge.**—*Plymouth Mental Hospital.* Res. Med. Supt., Dr. Wm. Starkey. Bittaford, ¼ mile; Wrangaton, G.W.R., 1½ miles; Ivybridge, 3 miles.

**Jersey.**—*Cranbourne Hall,* Grouville. Med. Supt., A. C. Stamberg, O.B.E., M.B. Grouville, 2 minutes' walk.

*Jersey Asylum.* Res. Med. Supt., Julius Labey, M.R.C.S. Gorey Village, 1 mile.

**Kilkenny.**—*District Mental Hospital,* Kilkenny. Res. Med. Supt., Louis Buggy, L.R.C.P. Kilkenny station, ¼ mile.

**Killarney.**—*District Asylum.* Res. Med. Supt., E. W. Griffin, M.D. Killarney, ½ mile.

**Lancashire (near Newton-le-Willows).**—*Haydock Lodge,* Private Mental Hospital. Res. Med. Prop., Dr. C. T. Street. Newton-le-Willows, 2 miles.

**Lancaster.**—*County Asylum.* Res. Med Supt., D. M. Cassidy, M.D. Lancaster, L. & N.W. and L.M. & S.R. stations, each 1¼ miles.

**Larbert (Stirlingshire).**— *The Royal Scottish National Institution* (for education of imbecile children). Res. Med. Supt., Dr. R. D. Clarkson. Larbert station, 1 mile.

**Leek (Stafford).**—*County Mental Hospital,* Cheddleton. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

**Leicester.**—*City Mental Hospital,* Humberstone. Res. Med. Supt., J. F. Dixon, M.D. Humberstone, L. & N.-E.R., ½ mile; Leicester, L. & N.-E. R. & L.M. & S.R., 2 miles.

*Leicestershire and Rutland Asylum.* Res. Med. Supt., R. C. Stewart, M.R.C.S. Narborough, ¾ mile; Leicester, 6 miles.

**Letterkenny.**—*Tirconaill Mental Hospital.* Res. Med. Supt., E. E. Moore, M.D. Letterkenny and Lough Swilly Rly., 1 mile.

**Lichfield.** — *County Mental Hospital,* Burntwood, near Lichfield. Res. Med. Supt., J. B. Spence, M.D. Lichfield City, 3½ miles; Hammerwich, 1½ miles.

**Limerick.**—*District Asylum.* Res. Med. Supt., Dr. P. J. Irwin. Limerick station, ½ mile.

**Lincoln.**—*Bracebridge Mental Hospital.* Res. Med. Supt., John Macarthur, D.P.M. Lincoln, L. & N.E.R., 2½ miles.

*The Lawn,* Lincoln. Res. Med. Supt., Arthur P. Russell, M.B. Lincoln station, 1 mile. *See also Advt.. p.* **94**

**Liverpool.**—*Shaftesbury House,* Formby, near Liverpool and Southport. Res. Med. Supt., Stanley A. Gill, M.D., M.R.C.P. Formby, ¼ mile. *See also Advt., p.* **95**

*Tue Brook Villa,* Liverpool, E. Res. Med. Supts., Drs. Tisdall and Moyes. Tue Brook station ¾ mile, or Green Lane car. *See also Advt., p.* **70**

**London.**—*Bethlem Royal Hospital*, Lambeth Road, London, S.E. Phys. Supt., J. G. Porter Phillips, M.D., F.R.C.P. *See also Advt., p.* **87**

*Brooke House*, Clapton, E. 5. Res. Med. Supt., Dr. Gerald Johnston. Clapton, G.E.R.

*Camberwell House*, 33, Peckham Road, S.E.5. Res. Med. Supt., F. H. Edwards, M.D., M.R.C.P. Asst. Med. Off., H. J. Norman, M.B., Ch.B., D.P.H. Tel.: "Psycholia, London." Telephone: New Cross 1057. *See also Advt., p.* **86**

*Chiswick House*, Chiswick, W.4. Res. Lic., C. M. Tuke, M.R.C.S. Chiswick station, ½ mile; Turnham Green station, 1 mile.

*Clarence Lodge*, Clapham Park, S.W. 4. Prop., Mrs. F. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel. No. 494 Brixton. *See also Advt., p.* **102**

*Featherstone Hall*, Southall (for ladies). Res. Med. Lic., W. H. Bailey, M.D. Southall station, 5 minutes.

*Fenstanton*, Christchurch Road, Streatham Hill. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes.

*Flower House*, Catford, S.E. 6. Res. Med. Supt., A. E. Price, M.D., M.S. S.E. & C. Rly., Beckenham Hill, 5 minutes.

*Halliford House*, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, 1¼ miles.

*Hanwell Mental Hospital*, Southall. Res. Med. Supt., A. W. Daniel, M.D.

*Hayes Park*, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell. Hayes, 2 miles.

*Hendon Grove Asylum* (for ladies), Hendon, N.W. 4. Med. Lic., H. L. de Caux, L.M.S.S.A., L.S.A. (Lond.). By L.M. & S.R., Hendon station, ½ mile.

*London County Council*, The Manor Certified Institution, Epsom. Res. Med. Supt., Dr. E. S. Litteljohn. S.R. and L.B. & S.C.R., 1½ miles.

*London County Mental Hospital*, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. P. C. Spark. Belmont station, ½ mile; Sutton station, 1½ miles.

*London County Mental Hospital*, Bexley, Kent. Res. Med. Supt., G. Clarke, M.D. Bexley station, S.E.R., 1¼ miles.

*London County Mental Hospital*, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Lt.-Col. S. C. Elgee, O.B.E., L.R.C.P. & L.R.C.S. (I.). Coulsdon, S.E.R., or Coulsdon & Smitham Downs, 10 minutes.

*London County Mental Hospital*, Claybury, Woodford Bridge, Essex. Med. Supt., G. Foster Barham, M.D. Woodford Bridge station, G.E.R., 1½ miles. *See also Advt., p.* **101**

*London County Mental Hospital*, Colney Hatch, N. Res. Med. Supt., S. J. Gilfillan, O.B.E., M.A., M.B. New Southgate, L. & N.E.R.

*London County Mental Hospital*, Horton, Epsom. Res. Med. Supt., Lt.-Col. J. R. Lord, C.B.E., M.B., C.M. S.R. 1½ miles, L.B. & S.C.R., 1¾ miles.

*London County Mental Hospital*, Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. S.R. and L.B. & S.C.R.

*Mead House*, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

*Moorcroft House*, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Mr. J. F. Stilwell, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

*Newlands House*, Tooting Bec Common, S.W. 17. Private Mental Hospital for 12 ladies and 16 gentlemen. Phys. Supt., Dr. Noel Sergeant. Wandsworth Common, Balham and Streatham Hill stations, 1 mile. Motor bus Nos. 49, 49a, and 49b. *See also Advt., p.* **99**

*Northumberland House*, Green Lanes, N.4 Med. Supt., Bernard Hart, M.D. Finsbury Park station, 1 mile. *See also Advt., p.* **88**

*Otto House*, 47, North End Road, West Kensington (for ladies). Lic. Prop., Mrs. Sutherland. Lady Supt., Miss Brodie. West Kensington station, 1 mile; Barons Court station (Piccadilly Tube), 1 mile. *See also Advt., p.* **102**

*Peckham House*, 112, Peckham Road, S.E. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk. *See also Advt., p.* **101**

*Springfield Mental Hospital*, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

*St. Luke's Hospital for Mental Diseases* (re-building). (Offices, 19, Nottingham Place, W.) *See also Advt., p.* 59

*The Priory*, Roehampton, S.W., 15. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

*West Ham Mental Hospital*, Goodmayes, Ilford, E. Res. Med. Supt., Dr. John Custance Shaw. Goodmayes, 1 mile.

*Wood End House*, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes station, 1 mile; Uxbridge, 3 miles.

**Londonderry.**—*District Asylum.* Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

**Macclesfield.**—*Cheshire County Mental Hospital*, Parkside. Res. Med. Supt., H. Dove Cormac, M.B., M.S. Macclesfield, 1 mile.

**Maidstone.**—*Kent County Mental Hospital.* Res. Med. Supt., H. Wolseley-Lewis, F.R.C.S., M.D. Maidstone West, 1½ miles.

*Malling Place*, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

**Market Lavington (Wilts.).**—*Fiddington House.* Res. Med. Supt., J. R. Benson, F.R.C.S., F.R.C.P. Lavington, G.W.R., 1 mile ; Devizes, 6 miles. *See also Advt., p.* **100**

**Maryborough (Queen's County).**—*District Asylum.* Res. Med. Supt., Dr. P. Coffey. Maryborough, ½ mile.

**Melrose, N.B.**—*Roxburgh, Berwick, and Selkirk District Asylum.* Res. Med. Supt., Patrick Steele, M.D. Melrose, 1 mile.

**Melton (Suffolk.).**—*St. Audry's Hospital for Mental Diseases.* Res. Med. Supt., J. R. Whitwell, M.B. Melton station, 1¼ miles ; Woodbridge station, 2¼ miles.

**Menston (near Leeds).**—*West Riding Asylum.* Res. Med. Supt., S. Edgerley, M.D. Guiseley, 1 mile.

**Merstham (Surrey).**—*County Mental Hospital*, Netherne, near Coulsdon. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

**Middlesbro' (Yorks).**—*Mental Hospital.* Res. Med. Supt., Dr. J. W. Geddes. Middlesbro', 2 miles.

**Monaghan (Ireland).**—*District Asylum.* Res. Med. Supt., Dr. T. P. Conlon. Monaghan, ¼ mile.

**Montrose, N.B.**—*The Royal Asylum.* Res. Med. Supt., C. J. Shaw, M.D. Hillside, ¾ mile ; Dubton, 1 mile.

**Morpeth.**—*Northumberland Mental Hospital.* Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

**Mullingar.**—*District Asylum.* Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

**Newcastle-on-Tyne.**—*City Mental Hospital*, Gosforth. Res. Med. Supt., H. D. MacPhail, M.D. Newcastle, 4 miles.

**Northampton.**—*Berrywood Mental Hospital.* Res. Med. Supt., Dr. F. J. Stuart. Castle station, 2½ miles ; L.M. & S.R. station, 3 miles.

*St. Andrew's Hospital*, Northampton. Med. Supt., D. F. Rambaut, M.A., M.D. Northampton station, 1 mile. *See also Advt., p.* **89**

**Norwich.**—*Bethel Hospital for Mental Diseases.* Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile.

*City of Norwich Mental Hospital*, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

*Heigham Hall*, Norwich. Res. Med. Prop., J. G. Gordon-Munn, M.D. Res. Phys., Dr. G. Stevens Pope. Thorpe station, 1½ miles. *See also Advt., p.* **70**

*Norfolk County Mental Hospital*, Thorpe, Norwich. Res. Med. Supt., O. C. Connell, M.C., L.R.C.P. & S. Whitlingham, 1 mile ; Norwich, 2½ miles.

*The Grove*, Old Catton, near Norwich (for ladies). Res. Med. Supt., C. A. P. Osburne, F.R.C.S. Apply to the Misses McLintock.

**Nottingham.**—*City Asylum*, Mapperley Hill. Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

*Notts County Mental Hospital*, Nottingham. Res. Med. Supt., S. L. Jones, M.R.C.S. Radcliffe-on-Trent, 2 miles.

*The Coppice*, Nottingham. Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, 2½ miles ; L. & N.-E.R. station, 1½ miles. *See also Advt., p.* **90**

**Omagh.**—*District Asylum.* Res. Med. Supt., Dr. John Patrick. Omagh, 2 miles.

**Oxford.**—*County and City Mental Hospital*, Littlemore. Res. Med. Supt., T. S. Good, O.B.E., M.R.C.S. Littlemore stat.

*The Warneford*, Oxford, 1½ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, 2¼ miles. *See also Advt., p.* **94**

**Paisley.**—*Craw Road Asylum.* Vis. Med. Off., H. C. Donald, F.R.C.S. Res. Med. Off., Miss Margaret L. Johnston, M.B. Paisley, 1 mile.

*Paisley Mental Hospital*, Riccartsbar. Res. Med. Off., Dr. Mary R. Knight. Paisley West, ¼ mile.

*Renfrew District Asylum*, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, 2¼ miles.

**Perth.**—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

*James Murray's Royal Mental Hospital*, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D. (Edin.). Perth station, under 2 miles. *See also Advt., p.* **97**

**Plympton.**—*Plympton House*, Plympton, South Devon. Res. Props., Dr. Alfred Turner and Dr. J. C. Nixon. Plympton, 1 mile ; Marsh Mlls, 2 miles ; Plymouth, 5 miles. *See also Advt., p.* **99**

**Portsmouth.**—*Borough Mental Hospital.* Res. Med. Supt., H. Devine, O.B.E., M.D. (Lond.). Clerk and Steward, John C. Kersey. Fratton, 1½ miles. *See also Advt., p.* **93**

**Prestwich (near Manchester).**—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Prestwich, ¾ mile.

**Rainhill (nr. Liverpool).**—*County Asylum.* Res. Med. Supt., — — —. St. Helens, 2½ miles ; Rainhill, 1 mile.

**Rotherham (Yorkshire).**—*The Grange*, 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N,-E.R., ½ mile. *See also Advt., p.* **96**

**St. Albans.**—*Herts County Mental Hospital*, Hill End. Med. Supt., A. N. Boycott, M.D. Hill End station, L. & N.E.R., 3 minutes.

*Napsbury Mental Hospital* (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., L. W. Rolleston, M.B., B.S. Napsbury, L.M. & S.R., 5 minutes' walk.

**St. Leonards-on-Sea.**—*Ashbrook Hall*, Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles E. H. Somerset. Warrior Square station, 2 miles.

**Salisbury.**—*Laverstock House*, Salisbury. Res. Med. Supt., J. R. Benson, F.R.C.S., F.R.C.P. Salisbury, 1½ miles. *See also Advt., p.* 100

*Old Manor Mental Hospital.* Med. Supt., Dr. S. E. Martin. Salisbury station, S.R. and G.W.R., 5 minutes.

**Shrewsbury.**—*Salop Mental Hospital*, Bicton Heath. Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury station. 2½ miles.

**Sleaford.**—*Kesteven County Asylum.* Med. Supt., I. R. Macphail, L.R.C.P. & S. Rauceby, L. & N.E.R., ¼ mile.

**Sligo.**—*District Asylum.* Res. Med. Supt., Dr. P. O'Doherty. Sligo, 1½ miles.

**Stafford.**—*County Mental Hospital.* Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

*Coton Hill Mental Hospital*, Stafford. Res. Med. Supt., R. W. Hewson, L.R.C.S. & P. (Edin.). Stafford, 1 mile.

**Stirling.**—*District Asylum*, Larbert. Med. Supt., Dr. R. B. Campbell. Larbert, 1½ miles.

**Stone (near Aylesbury).**—*Bucks Mental Hospital.* Res. Med. Supt., H. Kerr, M.D. Aylesbury, 3¼ miles. *See also Advt., p.* 98

**Talgarth.**—*Mid-Wales Counties Mental Hospital.* Res. Med. Supt., R. Pugh, M.D. Talgarth, 1 mile.

**Tamworth (Staffs.).**—*The Moat House* (for ladies). Res. Licensees, Claude Hollins, and Mrs. S. A. Michaux. Med. Attendant, Dr. Lowson. Tamworth station, ¾ mile. *See also Advt., p.* 102

**Taunton.**—*Somerset & Bath Asylum* Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

**Ticehurst (Sussex).**—*Ticehurst House.* Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Road, 3 miles.

**Virginia Water.** — *Holloway Sanatorium*, Hospital for the Insane, St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., C. Rutherford, M.B., Elizabeth Casson, M.B. and R. A. MacNab, M.B. Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's*, Canford Cliffs, Bournemouth. Med. Off., C. G. Cowie, M.D. *See also Advt., p.* 91

**Wadsley (near Sheffield).**—*South Yorkshire Asylum.* Res. Med. Supt., W. J. N. Vincent, C.B.E., M.D. Wadsley Bridge, 1 mile; Sheffield, 4 miles.

**Wakefield.**—*West Riding Asylum.* Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate station, 1 mile.

**Wallingford (Berks.).**—*Berkshire Mental Hospital.* Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

**Warlingham (Surrey).**—*Croydon Mental Hospital.* Res. Med. Supt., E. S. Pasmore, M.D. Upper Warlingham, 3¼ miles.

**Warrington (Lancs.).**—*Lancashire County Asylum*, Winwick. Res. Med. Supt., A. Simpson, C.B.E., M.D. Warrington, 2½ miles.

**Waterford.**—*Carriglea Mental Hospital*, Dungarvon, Co. Waterford. (For ladies). Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. J. C. Hackett.

*District Mental Hospital*, Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

*St. Patrick's Private Mental Hospital, and Sanatorium*, Belmont Park, Waterford. Conducted by the Brothers of Charity. Vis. Phys., Dr. P. Coghlan. Waterford station, 1 mile.

**Wells.**—*Somerset and Bath Asylum*, Wells, Som. Res. Med. Supt., Dr. J. E. P. Shera. Wells station, 1½ miles.

**Whitchurch (Salop).**—*St. Mary's House.* (For ladies only.) Res. Med. Supt., C. H. Gwynn, M.D. Whitchurch, 1 mile.

**Whittingham (near Preston).**—*County Asylum.* Res. Med. Supt., Dr. R. M. Clark. Whittingham station, 3 minutes.

**Winchelsea (Sussex).**—*Periteau*, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

**Woking (Surrey).**—*County Mental Hospital*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1¼ miles.

**Worcester.**—*County & City Mental Hospital*, Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

**York.**—*Bootham Park Registered Hospital*, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile. *See also Advt., p.* 86

*The Pleasaunce*, York (ladies only). Phys. Supt. and Res. Licensee, L. D. H. Baugh, M.B. York, 1½ miles. *See also Advt., p.* 92

*The Retreat*, York. Res. Med. Supt., H. Yellowlees, O.B.E., M.D., F.R.F.P.S. (Glas.), M.R.C.P. (Edin.), D.P.M. York station, 1½ miles. *See also Advt., p.* 96

*North Riding of Yorkshire Asylum*, Clifton, York. Res. Med. Supt., Dr. A. I. Eades. York, 2 miles.

*York City Asylum*, Fulford, York. Res. Med. Supt., Dr. C. L. Hopkins. Naburn, N.E.R., ½ mile.

# MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

*Class A.*—Certified Institutions. *Class B.*—Institutions approved under Section 37.

*Class C.*—Certified Houses. *Class D.*—Approved Homes.

## BERKSHIRE.

*Cumnor Rise, Oxford.* — 33 females. High-grade feeble-minded. Managers, Committee. Hon. Secretary, Honble P. Bruce, 4, Wellington Place, St. Giles, Oxford. (*Class A.*)

## BUCKINGHAMSHIRE.

*Winslow Union Workhouse, Winslow.*—20 male, 20 female, adults. Feeble minded and imbecile. Managers, Winslow Board of Guardians. (*Class B.*)

## *CHESHIRE.*

*Sandlebridge, near Alderley Edge.*—295 males and females. Life care is provided, but only educable mentally defective children under 13 years of age are eligible for admission. Managers, Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble Minded. Sec., E. M. Richards, 1, Brazenose Street, Manchester. (*Class A.*)

*Ashton House, 26, Village Road, Oxton, Birkenhead.* For 40 girls (high grade only). Supt., Miss O. M. Wilkinson. (*Class C.*)

## CORNWALL.

*The Elizabeth-Barclay Home, Bodmin.*—26 females. Matron, Miss E. Hunt; Hon. Sec., Miss M. I. Braddon, Skisdon, Wadebridge. (*Class D.*)

## CUMBERLAND.

*Durran Hill House, Carlisle.* — 65 females. Feeble minded. Higher Grade. Sec., T. W. Hunter, Archbishop's House, Westminster, S.W.1. (*Class A.*)

## DERBYSHIRE.

*Whittington Hall, Whittington, near Chesterfield.* — 400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W. 1. (*Class A.*)

## DEVON.

*Western Counties Institution, Starcross.*—450 males and females (trainable children). Sec. Supt., E. W. Locke. (*Class A.*)

## DORSET.

*Mount Tabor, Lower Parkstone.*—16 females. Supt., Sister Mary Frances. (*Class A.*)

## DURHAM.

*Monkton Hall Home for Lads, Jarrow-on-Tyne.*—48 males. Sec., J. Stewart, 90, Pilgrim Street, Newcastle. (*Class A.*)

## ESSEX.

*Bigods Hall, R. C. Special School, near Dunmow.*—61 males. Corresponding Manager, Rt. Rev. Mgr. Wm. O'Grady, St. George's, Walthamstow, E. 17. (*Class A.*)

*Etloe House, Church Road, Leyton.*—102 high-grade feeble-minded females, over 16. Corresponding Manager, as for *Bigods Hall.* (*Class A.*)

*The Institution, Tendring, Clacton-on-Sea, Essex.*—26 males, 26 females. Managers, Guardians of the Tendring Union. Supt., H. J. Burden. (*Class A.*)

*Royal Eastern Counties Institution, Colchester.*—835 males and females, all grades. Managers, The Board of Directors. Address communications to the Medical Superintendent. (*Class A.*)

*The Co-operative Sanatorium, Billericay.*—56 males of the middle class. Managers, The Co-operative Sanatoria Ltd. (*Class A.*)

*Gay Bowers, West Hanningfield, Chelmsford.*—7 males. Manager, Percy Chennells. (*Class D.*)

## GLOUCESTERSHIRE.

*Brentry Certified Institution, Westbury-on-Trym, Bristol.*—230 males. Res. Supt., T. R. Lambert; Med. Off., Dr. Ormerod. Clifton Down, Redland, or Patchway stations, 3½ miles. (*Class A.*)

*Poor Law Institution, Stapleton.*—24 males, 36 females. Managers, Bristol Board of Guardians. Superintendent, L. W. Williams. (*Class A, B, C,* and *D.*)

*St. Mary's Home, Painswick, near Stroud.*—29 females. High-grade feeble-minded. Apply, Lady Supt. (*Class A.*)

*Stoke Park Colony, Hanham Hall, Hanham, near Bristol.*—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

*Stoke Park Colony, Royal Victoria Home, Horfield.* — 42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

*Stoke Park Colony, Stapleton, Bristol.*—750 patients of both sexes (not exceeding 650 females or 300 males). Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*) *See also Advt., p.* 69

*Stoke Park Colony, West Side, Stapleton.*—178 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

*Royal Fort Home, Bristol.*—20 females, high-grade mentally deficient. Managers, Ladies' Committee. Hon. Sec., Miss Savill, 40, Tyndall's Park Road. (*Class D.*)

## HAMPSHIRE.

*St. Mary's Home, Alton.*—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. (*Class A.*)

*Poor Law Institution, Parkhurst, Isle of Wight.*—5 males, 5 females. Supt., J. Mckeown. Managers, Isle of Wight Board of Guardians. (*Class B.*)

## HERTS.

*Hillside Special School for Mentally Defective Boys, Buntingford.*—43 males. Secretary, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (*Class A.*)

*St. Elizabeth's Home for Epileptics, Much Hadham.*—136 males and females. Apply to T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (*Class A.*)

*Rowley Lodge, Rowley Green, Barnett*—Educational home for 13 backward boys and girls. Principals, The Misses Wall and Binney. (*Class C* and *D.*)

*See also Advt., p.* 67

## KENT.

*Princess Christian's Farm Colony, Hildenborough.* — 73 males, 68 females. Managers, National Association for the Feeble Minded. Superintendent, Miss Pitman. (*Class A* and *D.*)

## LANCASHIRE.

*Allerton Priory R.C. Special Industrial School, Woolton, Liverpool.*—106 male and female educable children. Superintendent, Sister E. Thompson. (*Class A.*)

*Brockhall, Whalley, near Blackburn.*—308 females. Feeble minded, imbeciles, and moral imbeciles. Managers, Mental Deficiency Acts Committee, Lancashire Asylums Board, Preston. (*Class A.*)

*Pontville R.C. Special School, Ormskirk.*—106 boys. Mentally defective. Corresponding Manager, Right Rev. Monsignor Canon Pinnington, 109, Great Mersey Street. Liverpool. (*Class A.*)

*Royal Albert Institution, Lancaster.*—800 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Secretary, Samuel Keir. (*Class A.*) *See also Advt., p.* 69

*Seafield House, Waterloo Road, Seaforth, near Liverpool.*—240 feeble minded children. Managers, Guardians of the West Derby Union, Liverpool. (*Class B.*)

## LEICESTERSHIRE.

*Cross Corners, Thurgaston Road. Leicester.*—32 females. Feeble minded. Managers, Leicester Corporation Mental Deficiency Committee. Clerk, C. F. Smith, Alliance Chambers, Horsefair Street, Leicester. (*Class A.*)

## LONDON.

39, *Downs Road*, 41, *Downs Road*, 46–48, *Pembury Road, Clapton, E.* 5.—80 females. Apply: Hon. Sec., Miss C. Tozer, 39, Downs Road, Clapton, E. 5. (*Class A.*)

*Springfield Lodge, Grove Hill Road, Denmark Hill, S.E.* 5.—28 females. Supt., Miss Salt. (*Class A.*)

*The Helping Hand Home*, 16, *Cathcart Hill, N.*—30 females. High grade mentally deficients. Managers, Committee; Hon. Sec., Mrs. Geoffrey-Russell, 17, Church Row, Hampstead, N.W. 3. (*Class A.*)

*Kensington Guardians' Institution*, Marloes Road, W. 8.—60 females. Managers, Guardians of the Poor of the Parish of St. Mary Abbots, Kensington. Supt., Mr. Francis Birch. (*Class B.*)

*Woolwich Workhouse. Plumstead, S.E.*—25 males, 45 females sent by L.C.C. only. Managers, Board of Guardians of the Woolwich Union. E. G. Manning, Supt. (*Class B.*)

## MIDDLESEX.

*All Souls' Special School, Pield Heath House, Hillingdon.* — 89 females. Educable and imbeciles. Manager, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (*Class A.*)

*Bramley House, Gordon Hill, Enfield.*—45 females. Supt., Miss A. Gardner. (*Class A.*)

*Crathorne, Oak Lane, East Finchley, N.*—32, consisting of women with their infants. Hon. Sec., Miss Pierce, 57, Bryanston Street, W. 1. (*Class A.*)

*Enfield House*, 19, *Chase Side Crescent, Enfield, Middlesex.*—40 males. Managers, Guardians of Edmonton Union. Superintendent, E. B. Willett. (*Class A.*)

*Warkworth House, Isleworth.*—38 boys. Managers, Middlesex County Council. Supt., S. F. Rowbotham. (*Class B.*)

*Arniston*, 44, *The Grove, Isleworth.*—10 males under 14, and 10 females. Managers, Misses J. M. and M. D. Isbister. (*Class C.*)

*Normansfield, Hampton Wick.* — 140 males and females. Manager, Dr. R. L. Langdon-Down. (*Class C.*)

*See also Advt., p.* 67

*The Gables, Upper Teddington Road, Hampton Wick.*—18 male and female children. Manager, Miss Frances M. Deck. (*Class C.*)

*Alexander House,* 117, *High Street, Uxbridge.*—24 females over 16. Managers, Committee. Supt., Miss E. Collyer. (*Class D.*)

*Conifers, Hampton Wick.*—16 females, and 3 male children. Manager, Dr. R. L. Langdon-Down. (*Class D.*)

*Trematon, Hampton Wick.*—24 males. Manager, Dr. R. L. Langdon-Down. (*Class D.*)

## NORFOLK.

*The Lodge, Bowthorpe Road, Norwich.*—6 adult males, 20 adult females. Managers, The Guardians of the Poor of the Norwich Incorporation. (*Class B.*)

*The Otleys, Seething, Norwich.*—30 females, children and girls. Superintendent and Proprietress, Miss S. A. Huntly. (*Class D.*)

## NORTHUMBERLAND.

*Prudhoe Hall Colony, Prudhoe.*—185, all classes. Managers. Northern Counties Joint Poor Law Committee. Supt., Miss N. M. Hawkes. (*Class A* and *B.*)

*Home of Industry, Bow Villa, Morpeth.*—16 females. Feeble minded. Superintendent, Miss A. Pawsey. (*Class D.*)

## SOMERSET.

*Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.*—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

*Rock Hall House, Combe Down, Bath.*—18 males, 19 females. Supt., Miss J. Quinton. (*Class A.*)

*Long Ashton Poor Law Institution, Flax Bourton, near Bristol.* — 32 males, 34 females. Managers, Guardians of the Long Ashton Union. (*Class B.*)

## STAFFORDSHIRE.

*Burton-on-Trent Poor Law Institution.*—3 males, 2 females. Managers, Guardians Burton Union. Master, R. Bareham. (*Class A.*)

*New Cross Poor Law Institution, Mental Wards, Wolverhampton.*—1 male. Managers, Wolverhampton Board of Guardians. Supt., T. D. Rollinson. (*Class A.*)

*Poor Law Institution, Dudley, Stafford.*—50 males, 50 females. Managers, Guardians of the Dudley Union. (*Class B.*)

## SUFFOLK.

*Handford Home, Ranelagh Road, Ipswich.*—20 females. Supt., Mrs. A. Turner. Crane Hall, Ipswich. (*Class A.*)

*St. Joseph's Home, The Croft, Sudbury.*—19 females. Supt., Sister Frances Borgia. (*Class A.*)

## SURREY.

*Royal Earlswood Institution, Redhill.*—550. Med. Supt., Dr. C. Caldecott. Secretary, 14, Ludgate Hill, E.C. 4. (*Class A.*)

## SUSSEX.

*Avonhurst, Burgess Hill.*—22 private cases only, males and females under 16. Manager, Miss S. M. Macdowall. (*Class C.*)

## WARWICK.

*Agatha Stacey Homes, Rednal, near Birmingham.*—40 females; and *Enniskerry, Knowle, Warwickshire.*—24 females. Managers, The Central Committee, 158, Broad Street, Birmingham. (*Class A.*)

*Midland Counties Institution, Knowle, near Birmingham.*—117 males, 10 females. Managers, The Committee. Superintendent, A. H. Williams. Medical Officer, J. O. Hollick, M.B. (*Class A.*)

## WILTS.

*Devizes Poor Law Institution.* — 11 females between the ages of 20 and 50 years. Managers, Devizes Board of Guardians. (*Class B.*)

*Pewsey Poor Law Institution, Pewsey.*—12 females, 12 males. Managers, Pewsey Board of Guardians. Supt., H. England. (*Class B.*)

*Poor Law Institution, Semington, near Trowbridge.*—6 males, 30 females. Managers, Guardians Trowbridge and Melksham Union. Supt., C. H. Taylor. (*Class B.*)

## WORCESTERSHIRE.

*Besford Court Home near Defford.*—For educable mentally defective boys from 8 to 16 years. Administrator, The Right Rev. Monsignor T. A. Newsome. (*Class A.*)

*Evesham Poor Law Institution.*—Certified only for dealing with cases arising in the Evesham Union Area. Superintendent, J. H. Damen. (*Class B.*)

## YORKSHIRE.

*Mid-Yorkshire Institution, Whixley, York.*—130 males. Managers, The Mid-Yorkshire Joint Board. Supt., J. A. Benson. (*Class A.*)

*The Grange, Altofts, Normanton.*—15 females, good class. Mentally deficient, epileptics. Proprietor, Mrs. E. A. Howard. (*Class C.*)

# INSTITUTIONS AND HOMES FOR INEBRIATES.

## LICENSED UNDER THE ACTS, 1879–1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

* NOTE :—Ashford is a Roman Catholic Religious Institution.

### MALES ONLY.

**Folkestone.**—*Capel Lodge*, near Folkestone. Res. Prop., E. Norton, M.D. Folkestone Junction, 2 miles.

**Rickmansworth (Herts).** — *Dalrymple House.* Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, L. & N.-E.R. & Metropolitan Rlwy, ½ mile ; L. & N.W.R., 1 mile. *See also Advt., p.* 79

### FEMALES ONLY.

**Ashford (Middlesex).*** — *Ecclesfield.* Med. Supt., Dr. M. F. Cock. Apply, Mother Superior. Ashford station, 1 mile. *See also Advt., p.* 79

**Belfast.**—*The Lodge Retreat,* Irwin Avenue, Strandtown. Med. Attendant, R. W. Leslie, M.D. Co. Down line train, 2 minutes' walk.

**Beverley (E. Yorks).**—*Albion House.* Med. Supt., H. L. Munro, M.D. Hon. Sec., Mrs. T. R. Pentith, The Limes, Sutton-on-Hull. Beverley, 1 mile.

**Leicester.**—*Melbourne House.* Principal, Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D. Station, 2 miles.

**Reigate (Surrey).**—*The Lady Henry Somerset's Homes,* Duxhurst. Supt. and Res. Trustee, Miss Cass, O.B.E. Reigate, 4 miles ; Horley, 3 miles.

**Spelthorne St. Mary (Bedfont, Middlesex).**—Apply to the Sister Superior C.S.M.V. Med. Supt., Dr. H. W. Newton. Feltham, S.W.R., 1 mile.

**Torquay.**—*Temple Lodge* (*C.E.T.S. Institution*). Res. Supt., Sister in Charge. Med. Off., W. Odell, F.R.C.S. *See also Advt., p.* 79

## UNLICENSED HOMES.

**Beckenham (Kent).** — *Norwood Sanatorium,* The Mansion, Beckenham Park. Med. Supt., F. Hare, M.D. Beckenham Junction, 10 minutes. *See also Advt., p.* 78

**Paignton (Devon).**—*Bay Mount,* for both sexes. Res. Med. Supt., Dr. Stanford Park. *See also Advt., p.* 78

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# SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

**Aberchalder (N.B.).** — *Inverness-shire Sanatorium.* Med. Supt., D. S. Johnston, M.D. Aberchalder, 2 miles.

**Arosa (Switzerland).**—*The Altein Sanatorium.* Res. House-Phys., Dr. H. Heinz. Man. Director, P. Wieland. *See also Advt., p.* 77

**Ashford (Kent).**—*Grosvenor Sanatorium,* Kennington, near Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B. D.P.H.

**Aysgarth, S.O. (Yorks).**—*Wensleydale Sanatorium.* Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, ½ mile, via Northallerton, N.E.R. and Hawes Junction, L.M. & S.R. *See also Advt., p.* 72

**Baguley (Cheshire).** — *Baguley Sanatorium.* For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley, 1½ miles.

**Banchory (Scotland).** — *Nordrach-on-Dee.* Senr. Phys., Ian S. Stewart, M.D. Banchory, 1½ miles.

**Barrasford (Northumberland).** — *The Newcastle-on-Tyne Sanatorium.* Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, N.B.R., 4 miles.

**Benenden (Kent).**—*Sanatorium* of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis." Res. Med. Supt., Dr. H. Spurrier. Biddenden, 3 miles.

**Bingley (Yorks.).**—*Eldwick Sanatorium* (West Riding County Council school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

**Birmingham.** — *Municipal Sanatorium.* Yardley Road. Med. Supt., Dr. G. B. Dixon.

*Romsley Hill Sanatorium.* Halesowen, near Birmingham. Res. Med. Supt., Dr. P. J. Bodington. Halesowen, 4½ miles.

*St. Gerard's Sanatorium*, Coleshill, near Birmingham. For Surgical Tuberculosis. Children only. Orthopædic Surg., Mr. Naughton Dunn. Med. Off., J. B. Wall, M.D. *See also Advt., p.* 74

**Bolton (Lancs.).**—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. J. D. Marshall.

**Bournemouth.**—*Royal National Sanatorium for Consumption and Diseases of Chest.* Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, 1¼ miles; Bournemouth West, ½ mile.

*The Firs Home* (for advanced cases). Hon. Sec., Col. R. F. Anderson. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central, ½ mile.

*The Home Sanatorium*, West Southbourne, Bournemouth. Res. Med. Supt., J. E. Esslemont, M.B., Ch.B. Bournemouth Central, 2½ miles; Boscombe, 1½ miles; Christchurch, 2½ miles. *See also Advt., p.* 72

**Bovey Tracey (Devon).**—*Hawkmoor Sanatorium.* Med. Supt., Dr. J. C. Smyth.

**Bradford.**—*Bierley Hall Sanatorium*, Bierley Lane. For women and children only. Res. Med. Supt., Dr. L. G. White; and *Odsal Sanatorium.* For men only. Med. Supt., Dr. R. F. Chance.

**Bridge of Weir (Renfrewshire).**—*Consumption Sanatoria of Scotland.* Hon. Treas., Sir Joseph P. Maclay, Bart., 21, Bothwell Street, Glasgow. Res. Med. Supt., James Crocket, M.D. Bridge of Weir, 2 miles.

**Brighton.** — *Municipal Sanatorium.* for Brighton townsfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

**Chagford (Devon).**—*Dartmoor Sanatorium.* Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead G.W.R., 6 miles. *See also Advt., p.* 72

**Chelmsford (Essex).**—*Great Baddow Sanatorium.* Med. Supt., R. G. Lyster, O.B.E., M.B., B.S. Chelmsford, G.E.R., 4 miles.

**Cheltenham.**—*Cranham Lodge Sanatorium*, Stroud, Glos. Res. Med. Supts., A. H. Hoffman, M.D., and Geoffrey A. Hoffman, M.B. Cheltenham, 8 miles.

*Salterley Grange Sanatorium*, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, 2½ miles; Cheltenham, 3¾ miles.

**Darlington.**—*Felix House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

**Davos-Platz (Switzerland).**—*The Schatzalp Sanatorium.* Med. Supt. Dr. Edward C. Neumann. *See also Advt., p.* 77

*The Sanatorium Turban*, Davos-Platz. Med. Directors, Dr. K. Turban and Dr. A. F. Mayer. *See also Advt., p.* 76

**Derbyshire.**—*Ashover Sanatorium*, near Chesterfield. Res. Med. Supt., Miss Ida E. Fox, M.D. Stretton, L.M. & S.R., 3½ miles; Matlock, 4 miles.

**Devon and Cornwall** *Sanatorium*, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Supt., Dr. W. B. Livermore. Brent, G.W.R., 2 miles.

**Doneraile (Co. Cork).**—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

**Dublin.**—*Peamount Sanatorium*, Hazelhatch, Dublin. Res. Med. Supt., Dr. G. P. H. Sheehan. Lucan, 2 miles.

**Dundee (near).**—*Sidlaw Sanatorium*, Auchterhouse. Vis. Phys., W. E. Foggie, D.S.O., M.D.; Vis. Surg., L. T. Price, F.R.C.S.E. Matron, Miss Ellen Norris. Auchterhouse station, 1½ miles.

**Durham.**—*Durham County Consumption Sanatoria.* Sec., Mr. F. Forrest, 54, John Street, Sunderland. For men: Stanhope, Med. Supt., John Gray, O.B.E., M.B. Stanhope station, 1 mile. For women and children: Wolsingham, Med. Supt., Dr. E. G. D. Menzies. Wolsingham station, ¾ mile.

**East Fortune (East Lothian).**—*South-Eastern Counties of Scotland Joint Sanatorium.* Med. Supt., Charles Cameron, M.D.

**Edinburgh.**—*Royal Victoria Hospital for Consumption.* Under the Corporation of the City of Edinburgh, and the supervision of the Public Health Department, City Chambers, Edinburgh.

**Fortbreda, Belfast.**—*Forster Green Hospital for Consumption and Chest Diseases.* Sec., J. Osborne, 99–103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

**Frimley (Surrey).**—*Brompton Hospital Sanatorium.* Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles. *See also Advt., p.* 52

**Grange-over-Sands.** — *Westmorland Sanatorium*, Meathop. Res. Med. Supt., C. F. Walker, M.D., D.P.H. Grange-over-Sands station, 2 miles.

**Harpenden (Herts).**—*Sanatorium of the National Children's Home and Orphanage* Vis. Phys., T. N. Kelynack, M.D. Principal, Rev. Dr. A. E. Gregory, Bonner Road, E. 2.

**Hastings.** — *Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Off., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

**Heswall (Cheshire).** — *Cleaver Sanatorium for Children.* Med. Supt., J. B. Yeoman, M.D. Matron, Miss Bateson. Heswall, 1½ miles.

**Huddersfield.**—*Bradley Wood Sanatorium for Pulmonary and Surgical Tuberculosis*, Bradley. Med. Supt., S. G. Moore, M.D. Bradley, 1 mile.

**Hull.**—*Hull and East Riding Convalescent Home*, Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproulle, L.R.C.P. Withernsea station.

**Huntingdon.**—*Wyton Sanatorium* (for women and children). Med. Supt., C. B. Moss-Blundell, M.D.

**Isle of Wight.**—*Royal National Hospital for Consumption*, Ventnor. Res. Med. Supt., Dr. R. C. Hutchinson. Sec., Charles W. Cox, 18, Buckingham Street, Strand, W.C. Ventnor, 1 mile.
*See also Advt., p.* 75

*St. Catherine's Home Sanatorium*, Ventnor (for early cases of phthisis in children). Apply Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Ventnor, 5 minutes' drive.

**Kingussie (Inverness-shire).**—*Grampian Sanatorium.* Res. Med. Supt., Dr. Felix Savy. Kingussie, ¾ mile.
*See also Advt., p.* 75

**Kirkcaldy.**—*Sanatorium for Tuberculosis.* Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk. Kirkcaldy, 1 mile.

**Lanark.**—*City of Glasgow Sanatorium*, Bellefield, Lanark. Res. Med. Supt., Dr. Alex. Young. Lanark, 20 minutes' walk.

**Leeds.**—*Leeds Sanatorium for Consumptives*, Gateforth, near Selby, and *Leeds Hospital for Consumptives*, Armley. For poor of Leeds. Sec., C. H. Sedgwick, 37, Great George Street, Leeds.

**Leysin-Feydey (Switzerland).**—*Station Climatérique de Leysin*: Sanatorium Grand Hotel (Dr. Jaquerod), Sanatorium Mont-Blanc (Dr. Piguet), Sanatorium Chamossaire (Dr. Sillig), Sanatorium Belvedère. Leysin-Feydey station, from 1 to 5 minutes. *See also Advt., p.* 76

**Liverpool.**—*Liverpool Sanatorium for Consumptives*, Kingswood, Frodsham; and *Delamere Training Colony*, for tuberculous ex-service men, Frodsham. Sec., Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D. Frodsham, L. & N.W.R., 3½ miles.

*Park Hill Sanatorium*, Liverpool. Med. Supt., H. R. Macintyre, D.S.O., M.C., M.D.

**Llanybyther (Carmarthenshire).**—*West Wales Sanatorium.* The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Isabella Ferguson. Llanybyther station, 3 miles.

**London.**—*City of London Hospital for Diseases of the Chest*, Victoria Park, E. 2. Apply, Secretary. Cambridge Heath, G.E.R., Bus or Tram, 5 minutes.

*Mount Vernon Hospital for Tuberculosis and Diseases of the Lungs and Heart*, Northwood. Northwood (Met. & L. & N.E. Rly.), 1 mile. Res. Phys., Dr. W. G. Kinton. Out-patient department, 7, Fitzroy Square, W. Secretary, W. J. Morton.

*Royal Chest Hospital*, 231, City Road, E.C. (Branch of the Royal Northern Hospital, Holloway, N.). Apply to the Secretary.

**Manchester.**—*Hospital for Consumption and Diseases of Throat and Chest*, Bowdon; *Crossley Sanatorium*, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester.

**Margate (Kent).**—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis). Sec., A. Nash, 13, Charing Cross, S.W. 1. Margate West, ¼ mile.

**Matlock (Derbyshire).**—*Matlock Sanatorium.* Med. Supt., Dr. Frederick Kincaid. Matlock, 1 mile.

**Menai Bridge, Anglesey.**—*Penhesgyn-y-Gors Sanatorium.* Sister-in-charge, Miss Williams.

**Mendip Hills.**—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., Dr. C. Muthu. Wells station, 3 miles.
*See also Advt., p.* 75

*Nordrach-upon-Mendip*, Blagdon, near Bristol. Med. Supts., R. Thurnam, M.D., and Dr. D. Kennedy (Resident). Burrington station, 5 miles.

**Midhurst (Sussex).**—*King Edward VII Sanatorium.* Res. Med. Supt., Dr. H. O. Blanford. Midhurst, 4 miles.

**Murtle (Aberdeenshire).** — *Tor-na-Dee Sanatorium.* Res. Med. Supt., Dr. J. M. Johnston. Murtle, ½ mile.
*See also Advt., p.* 74

**Nayland (Suffolk).**—*East Anglian Sanatorium* for Private Patients, *Maltings Farm Sanatorium* for poorer men and women patients, *and East Anglian Children's Sanatorium,* Nayland. Med. Supt., Dr. Jane Walker (visits 4 days a week). Bures station, G.E.R., 3½ miles, Colchester, 8 miles. *See also Advt., p.* 74

**New Cumnock (Ayrshire).**—*Ayrshire Sanatorium,* Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

**Norfolk.**—*Children's Sanatorium for the Treatment of Phthisis, Incorporated,* Holt. Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, 68, Denison House, Vauxhall Bridge Road, S.W. I.

*Kelling Sanatorium,* Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, 1½ miles.

*Mundesley Sanatorium,* Mundesley. Res. Phys., S. Vere Pearson, M.D. Mundesley, 1 mile.

**Northampton.**—*Northamptonshire Sanatorium,* Creaton. Res. Med. Supt., Dr. C. Milne. Brixworth, L. & N.W.R., 3 miles.

**Nottingham.** — *Ransom Sanatorium.* Sherwood Forest, Mansfield. Res. Med. Off., Dr. R. R. S. Weatherson. Mansfield, 3 miles.

**Nuneaton (near).**—*Brameote Sanatorium,* Brameote. For men only. Res. Med. Supt., Dr. F. R. G. Heaf.

**Oban, Scotland.**—*Argyll County Sanatorium.* Vis. Med. Off., Duncan MacDonald, M.D. Oban, 1 mile.

**Oldham.**—*Strinesdale Sanatorium.* Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

**Peebles.**—*Manor Valley Sanatorium.* Med. Off., C. B. Gunn, M.D. Peebles, 4 miles, Lyne, 2 miles.

**Penmaenmawr (N. Wales).**—*Pendyffryn Hall Sanatorium.* Res. Phys., C. A. Sprawson, C.I.E., M.D., B.S. (Lond.), F.R.C.P. and C. H. Brodribb, M.B., B.S. (Lond.), L.R.C.P. Penmaenmawr, L. & N.W.R., 2 miles. *See also Advt., p.* 73

**Peppard Common (Oxon).**—*Berks. and Bucks. Joint Sanatorium.* Res. Chief Med. Off., Dr. Esther Carling. Reading, 6½ miles.

**Ringwood (Hants).** — *Linford Sanatorium.* Res. Phys., A. de W. Snowden, M.D., and H. A. F. Wilson, M.R.C.S. Ringwood station, 2½ miles.

**Rudgwick (Sussex).**—*Rudgwick Sanatorium.* Vis. London Phys., Dr. Annie McCall. Rudgwick station, 5 minutes.

**Ruthin (N. Wales).**—*Vale of Clwyd Sanatorium, Llanbedr Hall.* Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles. *See also Advt., p.* 76

**St. Leonards.**—*Eversfield Chest Hospital,* West Hill. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.E.R., West Marina, L.B. & S.C.R., within 5 minutes' walk.

**Sandon, near Chelmsford (Essex).**—*Merivale Sanatorium.* Res. Med. Supt., H. N. Marrett, M.R.C.S. Chelmsford station, G.E.R., 3½ miles.

**Sheffield.**—*The City Sanatoria.* Crimicar Lane Sanatorium (males); Commonside Sanatorium (females); Winter Street Sanatorium (both sexes); Fir Vale Sanatorium (children). Res. Med. Supt., John Rennie, M.D.

**Shirlett, near Broseley (Shropshire).**—*King Edward VII Memorial Sanatorium.* Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

**Skipton (Yorks).**—*Eastby Sanatorium for Children.* Res. Med. Supt., Dr. Catherine Arnott. Embsay station, 2 miles.

**Stannington (Northumberland).**—"*Philipson*" *Children's Sanatorium.* Res. Med. Off., Dr. Elsie F. Farquharson. Matron, Miss M. Campbell. Stannington station, 2 miles.

**Threlkeld (Cumberland).** — *Blencathra Sanatorium.* Res. Med. Supt., Dr. W. Goodchild. Threlkeld, C.K. & P.R., 2 m.

**Torquay.** — "*Whitecliff*" *Tuberculosis Hospital.* Med. Supt., Dr. E. Ward. Sec., W. F. Manley. Torre station.

**Warrenpoint (Co. Down).**—*Rostrevor Sanatorium.* Phys., Dr. J. A. O'Tierney. Apply Secretary.

**Whiteabbey, Co. Antrim.**—*Belfast Municipal Sanatorium.* Res. Med. Supt., S. H. Stewart, M.D.

**Wicklow.**—*The Royal National Hospital for Consumption for Ireland,* Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles.

**Winsley, near Bath.**—*Winsley Sanatorium.* Senr. Res. Med. Off., Dr. Chas. F. Pedley. Limpley Stoke station, 1 mile.

**Woking (Surrey).**—*St. Katherine's,* Hook Heath. Res. Med. Supt., Dr. A. R. Snowdon.

**Worcester (near).**—*King Edward VII Memorial Sanatorium,* Knightwick. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, G.W.R., 1½ miles.

# HYDROPATHIC ESTABLISHMENTS.

**Baslow (Derbyshire).**—*Grand Hotel and Hydro.* Man., A. C. Mercer. Bakewell 4 miles; Grindleford 5½ miles.

**Ben Rhydding (Yorkshire).**—*Ben Rhydding Hydro.* Res. Phys., G. Cooper, M.D. Station, a few hundred yards.

**Birmingham.**—*The City Hydropathic and Massage Establishment,* 131, Monument Rd., Proprietor, Robert Schenkel (*Swiss*). *See also Advt., p.* 82

**Bournemouth (Hampshire).** — *Bournemouth Hydropathic.* Res. Med. Supt., W. J. Smyth, M.D. East station, 1½ miles; West station, ¼ mile.

*Durley Dean Hydro,* Bournemouth. Manager, W. J. Evans.

*Linden Hall Hydro,* Bournemouth. Apply Manager.

**Bristol.**— *The Bristol Hydropathic and Electrotherapeutic Establishment,* College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S. and A. T. Spoor, M.A., M.R.C.P., L.R.C.P. Temple Meads, 1¼ miles.

**Bute.**—*Kyles of Bute Hydropathic,* Port Bannatyne, Rothesay. Man., A. Menzies. Clyde steamers call daily.

**Buxton.**—*Buxton Hydro Hotel.* Manager, G. W. Bosworth. Station, 4 minutes.

*Haddon Hall Hydro,* Buxton. Proprietor, F. M. Osborn.

**Clifton (near Bristol).**—*Clifton Grand Spa Hotel and Hydro.* Clifton Down station, 1 mile: Bristol station, 1½ miles. Props., Mr. and Mrs. F. J. Price.

**Cork.**—*St. Ann's Hill Hydropathic.* Vis. Phys., Dr. J. M. O'Donovan. Blarney, 2¾; Cork, 8 miles.

**Crieff.**—*Strathearn Hydro* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

**Eastbourne.**—*Eastbourne Hydro Hotel.* Eastbourne, L.B. & S.C.R., 1 mile.

**Edinburgh.**—*Hydropathic,* Slateford.

**Forres.**—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam. Forres station, 1 mile; Inverness, 24 miles.

**Grange-over-Sands.**—*Hazlewood Hydro.* Carnforth, L. & N.W.R., then by Furness Railway; Grange-over-Sands, ¼ mile.

**Harrogate (Yorkshire).**—*Harlow Manor Hydro.* Manageress, Miss Oakley. Harrogate, 1 mile.

*The Harrogate Hydropathic Lim.* Phys., Dr. Hinsley Walker. Man., W. Taylor. Harrogate station, ½ mile.

**Hexham (Northumberland).**—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. D. Stewart. Hexham, 1 mile: Newcastle, 19 miles.

**Ilfracombe.**—*The Cliffe Hydro Hotel.* Physicians, H. K. V. Soltau, M.B., B.S. and K. I. Yeo, M.A., M.B. Ilfracombe, 1 mile.

**Ilkley (Yorkshire).**—*Craiglands Hydro.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). *See also Advt., p.* 85

*The Spa Hydro. Hotel,* Ilkley. Man., J. S. Brodie. Vis. Phys., Dr. Henry Veale. Ilkley, 3 minutes.

**Limpley Stoke (near Bath).** — *West of England Hydropathic.* Apply, the Secretary. Limpley Stoke station.

**Malvern.**—*The Malvern Hydro Lim.* Phys., Dr. H. Cavendish Fuller. Great Malvern, ½ mile. *See also Advt., p.* 80

*Wyche-side Hydropathic,* Malvern. Malvern Wells station. G.W.R., ½ mile; Great Malvern station, 2 miles.

**Matlock.**—*Rockside Hydropathic,* Matlock. Res. Med. Supt., Dr. Marie Goodwin-Orme, M.B.E. Man. Directors, Miss Goodwin and Mr. John G. Goodwin. Matlock, ½ mile. *See also Advt., p.* 82

*Smedley's Hydropathic,* Matlock. Res. and Vis. Physicians. Matlock station, ½ mile; omnibus. *See also Advt., p.* 83

**Moffat.**—*The Moffat Hydropathic.* Man., Miss Gardner. Med. Supt., Dr. D. Huskie. Moffat station, 1 mile.

**Peebles.**—*Peebles Hotel Hydropathic.* Res. Phys., K. R. Collis Hallowes, M.B., B.Ch. N.B. and Cal. stations about 10 to 15 minutes' walk. *See also Advt., p.* 81

**Rhos-on-Sea, Colwyn Bay.** — Rhos Hydropathic. Proprietress, Miss M. G. Lloyd.

**Southport (Birkdale Park).** — *Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations. *See also Advt., p.* 82

*Kenworthy's Hydropathic,* Southport. Phys., Dr. Kenworthy. Chapel Street (L. & Y.); Lord Street (Cheshire Lines). Telephone, 80. Tel.: "Kenworthy's, Southport." *See also Advt., p.* 84

**Tunbridge Wells.** — *The Spa Hotel.* Station about 1 mile. Apply, Manageress.

**Ulverston.**—*Conishead Priory Hydropathic.* Visiting Physician, Dr. Robert Ashburner. Ulverston station, 2 miles.

## NURSING INSTITUTIONS AND TRAINING INSTITUTIONS FOR NURSES.

**Birmingham.**—*Anstey Physical Training College*, Erdington. *See also Advt., p.* 64

**Bristol.**—*Bristol Nurses' Institute*, and Private Nursing Home, 3 and 4, Chesterfield Place, Clifton. Apply, Lady Supt. *See also Advt., p.* 65

**Liverpool.**—*Male and Female Nurses' Institution*, Hope House, Hope Street. Principal, Jno. Kynaston. *See also Advt., p.* 66

**London.**—*Cavendish Temperance Male Nurses' Corporation Lim.*, 43, New Cavendish St., W.1; 23, Upper Baggot St., Dublin; 28, Windsor Terr., Glasgow; and 176, Oxford Rd., Manchester. *See also Advt., p.* 65

*Chartered Society of Massage and Medical Gymnastics*, 157, Great Portland Street, W. Sec., Miss Templeton. *See also Advt., p.* 59

*Denmark Hill Physical Training College and School of Massage*, 41, Alleyn Park, S.E.21. *See also Advt., p.* 64

*Male Nurses' Association*, 29, York Street, Baker Street, W. 1. Sec., W. J. Hicks. *See also Advt., p.* 63

*New Mental Nurses' Co-operation*, 139, Edgware Road, Marble Arch, W. *See also Advt., p.* 66

*St. Luke's Hospital.* Trained Nurses for Mental and Nervous Cases. Lady Supt., 19, Nottingham Place, W. 1; also at 57, Clarendon Road, Leeds. *See also Advt., p.* 59

*Swedish Institute and Clinique*, 108, Cromwell Road, S.W.7. For Medical Gymnastics, Massage, and Electricity. *See also Advt., p.* 64

*The Nurses' Association*, 29, York Street, Baker Street, W. 1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks. *See also Advt., p.* 63

*The Nurses' Co-operation*, 22, Langham Street, Portland Place, W.1. Lady Supt., Miss Jackson, O.B.E., R.R.C. *See also Advt., p.* 65

**York.**—*The Retreat* (Trained Nurses' Department, for mental and nervous cases only). *See also Advt., p.* 96

## PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

**Alderley Edge (Cheshire).**—*The David Lewis Colony* (for Sane Epileptics), and *Colthurst House School* (for epileptic boys). Res. Director, Alan McDougall, M.D. Alderley Edge, 3 miles. *See also Advt., p.* 69

**Bath.**—*Lansdown Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Physicians, Dr. Percy Wilde and Dr. Wells-Beville. L.M. & S. or G.W. stations, 1 mile. *See also Advt., p.* 62

**Cheltenham.**—*Collingwood.* A nursery home for children in good social position: Principal, Miss Dutton. *See also Advt.*, 68

**Chorley Wood West (Herts).**—*Hensol Nursing Home.* Dr. Claud Fothergill. *See also Advt., p.* 68

**Clevedon (Somerset).**—*Mount Pleasant*, Victoria Road. For ladies suffering from nervous affections, etc. Apply, Dr. and Mrs. Clarke-Whitfeld. *See also Advt., p.* xliv

**Colinsburgh, Fife.**—*Kenlaw House*. Functional nervous diseases. Res. Phys., Dr. W. H. Bryce. *See also Advt., p.* 86

**Doddington (Kent).**—*Lady Margaret's Accouchement Home.* Secretary, Miss Sharpe. *See also Advt., p.* 68

**Gerrard's Cross (Bucks).**—*Welders*, for ladies suffering from neurasthenia and mild nervous disorders. Secretary, 19, Nottingham Place, W.1. *See also Advt., p.* 62

**Dedham, near Colchester (Essex).**—*Stour Valley Residential Nursing Home.* Convalescents and maternity cases. Res. Med. Prop., Dr. James R. Lownds. *See also Advt., p.* xliv

**Hadlow Down, Buxted (Sussex).**—*South Beacon* (for gentlemen mentally affected, but not ill enough to be certified). Prop., Philip H. Harmer. Buxted, 3 miles; Mayfield, 4 miles; Heathfield, 4 miles. *See also Advt., p.* xliv

**Harrogate.**—*Clovelly Nursing Home*, Clarence Drive. Rest cure, convalescent, medical and surgical cases. Lady Supt., Miss M. B. Bewsher, *See also Advt., p.* 71

**Hendon. N.W.9.**—*Springfield*, The Hyde. Maternity cases. Res. Phys., Dr. Mary Routledge. *See also Advt., p.* 66

**Kreuzlingen, Switzerland.**—*Dr. Binswanger Sanatorium Bellevue.* For nervous and mental complaints.
*See also Advt., p.* 78

**Leatherhead (Surrey).** — *The Royal School for the Indigent Blind.* Principal, Rev. St. Clare Hill, M.A.
*See also Advt., p.* xliii

**London.**—*Home of Rest for the Aged Sick and Infirm,* The Rest, 299–303, Trinity Road, Wandsworth Common, S.W.18.
*See also Advt., p.* 70

*Manna Mead Home for Invalids,* The Grove, Blackheath, S.E.10. Principals, Mrs. Knight and Miss Tapley-Spurr. Telephone: Greenwich 976.
*See also Advt., p.* 68

*The Radium Institute,* 16, Riding House Street, W. Med. Supt., A. E. Hayward Pinch, F.R.C.S. *See also Advt., p.* 71

**Mendip Hills.** — *The Court,* Blagdon, near Bristol (12½ miles). Nerve and general medical cases. Matron, Miss Hallen. Blagdon, ½ mile.
*See also Advt., p.* xliii

**Pinner (Middlesex).**—*St. Vincent's Open-air Hospital and School for Crippled Boys,* Eastcote. Tubercular and other joint diseases, infantile paralysis, etc. Eastcote, Metrop. Rly., 1¾ miles. *See also Advt., p.* 74

**Romsey (Hants).**—*Pain's Hill Farm,* Lockerly. Resident Patient (borderline, mental, or accouchement). Apply, Mrs. Breton. *See also Advt., p.* 66

**Sevenoaks.**—*The Grey House.* Farm and Garden School for backward, borderline, or nervous girls of gentle birth. Hon. Lady Supt., Mrs. Pearce Clark.
*See also Advt., p.* 67

**St. Leonards-on-Sea.**—*St. Paul's House, Special Home School,* 12, Upper Maze Hill. Certified by the Board of Education for the care and training of delicate and backward children. *See also Advt., p.* 67

*Brooklands, Special School for the Blind, Delicate and Backward,* Upper Maze Hill, St. Leonards-on-Sea. Approved by the Board of Education, for girls of all ages and boys under 8 years. Apply Principal.
*See also Advt., p.* 102

**Torquay.**—*Ockenden Convalescent Home.* Lady Supt., Miss Glover.
*See also Advt., p.* 70

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## PRINCIPAL BRITISH SPAS,

### With Indications for their Therapeutical Employment.

### THE BRITISH SPA FEDERATION,

Comprising the Spas of Bath, Buxton, Cheltenham, Droitwich, Harrogate, Leamington, Llandrindod Wells, Strathpeffer, Woodhall, and New Zealand.

**Bath (Somerset).**—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 2 hours from London. Climate mild and equable. Bath is at its busiest in the autumn, winter and spring months, but has an all-the-year-round season. A winter spa is of priceless value to any country, especially to such a country as Britain where, during the winter months, rheumatism in all its forms is particularly prevalent. During the summer there are some complaints in which Bath proves most efficacious.

*Waters.*—The only *hot* springs in Britain (120° F.) and the richest natural radio-active mineral waters in this country.

*Therapeutic indications.*—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions. A detailed list of complaints successfully treated will be sent on application.

*Baths.*—An extensive and thoroughly equipped bathing establishment. The Queen's Baths and the Old Royal Baths, the Royal Baths (opened 1916) and the New Wing (opened 1919) provide the latest and most approved balneo-therapeutic methods.

Bath *specializes* in the treatments for which its waters are particularly adapted: deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation. Particulars of the many other treatments given will be sent on request by John Hatton, Director of the Spa, Bath.

*Nursing and Baths.*—Lansdown Grove House (*See p.* 62).

(*See also p.* xxxviii).

**Buxton (Derbyshire).**—1000 to 1200 feet above sea-level. The highest town in the United Kingdom; 3¾ hours from London; 1 hour from Manchester. Served by the London, Midland and Scottish Railway. Average rainfall 44 inches. Sunshine 1476 hours. Sheltered from east winds. Very bracing air.

*Waters.*—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless. Chalybeate springs.

*Therapeutic indications.*—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucomembranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

*Baths.*—100 different treatments. All Continental treatments available. Establishments including St. Ann's Well (Pump Room), recently modernized at great cost. Open all the year round. All the latest equipment installed.

*Medical Profession, etc.*—Complimentary facilities granted to practising medical men and professional nurses.

*Boarding Establishment.*—The Buckingham (*See p.* **84**).

(*See also p.* xxxviii).

**Cheltenham (Gloucestershire).**—Protected from N. and N.E. winds by the Cotswold Hills, 184 feet above sea level; 3 hours from London. Climate soft and mild. Average rainfall 30 inches. Sunshine 1570 hours.

*Waters.*—Of four kinds: the Fieldholme or Twin Salt Saline, containing nearly equal parts of magnesium sulphate and sodium sulphate: sold in bottles by chemists, under the name of "Chelspa" aperient water; the Lansdown or Sodium Sulphate Saline, the chief ingredients of which are sulphate and chloride of sodium, closely resembling Kissingen waters; the Pittville or Alkaline Saline, the only alkaline natural water in Great Britain, very similar in analysis to Carlsbad or Marienbad waters; and the Chadnor or Magnesium and Calcium Saline, containing a large quantity of sulphate of magnesium and a considerable amount of carbonate and sulphate of calcium.

*Therapeutic indications.*—The Fieldholme water is most useful in gastric hyperacidity, sthenic dyspepsia, obesity, plethora, chronic constipation, hemorrhoidal conditions, and glycosuria associated with obesity; Lansdown water for anæmic dyspeptics, skin affections and chronic gastric catarrh; Pittville water for congestion of the liver, torpid liver, biliary catarrh, gastroduodenal catarrh and gall-stones, also for mucous colitis, toxæmia, glycosuria, and catarrhal conditions of the intestinal tract; and Chadnor water for renal disorders, lumbago, myalgia, torticollis, and other forms of fibrositis.

*Baths.*—An excellent set of baths and douche and massage apartments at the Montpellier Baths, close to the Central Spa. All the latest baths and treatment.

(*See also p.* xxxix).

**Droitwich (Worcestershire).**—150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall 26 inches. Mean winter temperature 44° F., summer 65° F. The climate is excellent for invalids both in summer and winter. Moderately bracing, but well protected from N. and N.E. winds.

*Waters.*—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (Channel), containing in every gallon 20,000 grains of saline in excess of other European waters: the waters are radio-active and radio-emanative.

*Therapeutic indications.*—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, heart diseases, especially those of myocardium—effect similar and equal to Nauheim treatment, or the Nauheim treatment, on the most approved principles, is given if prescribed—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, dry, scaly skin diseases, e.g., chronic eczema and psoriasis. Moist eczema is contra-indicated.

*Baths.*—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

*Hotel.*—Worcestershire Brine Baths Hotel. (*See p.* **85**).

(*See also p.* xxxix).

**Harrogate (Yorkshire).**—450–600 feet above sea level, 4½ hours from London. Unequalled by any Continental spa, especially for the treatment of gout and its complications. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 29 inches. Mean temperature 46° F.

*Waters.*—Celebrated for the medicinal properties of its 87 springs—sulphurous, chalybeate, alkaline, and saline. 'Aquaperia' aperient mineral water is bottled from a Spring at Harrogate by Camwal Ltd. (*See p.* **143**).

*Baths.*—There are five establishments, where nearly 100 treatments are given, including all the Continental systems and others. The staff of 200 are all medically trained, and the masseurs, etc., fully certificated. The waters are continually under scientific control by the highly qualified scientific officer on the permanent staff. Harrogate also possesses its own pathologist and bacteriologist, *x*-ray expert, etc.

The surrounding country is unsurpassed for beauty and interest, and the amusements and recreations are of the highest order.

*Nursing.*—Clovelly Nursing Home. (*See p.* 71.)

(*See also p.* xl).

**Leamington Spa (Warwickshire).**—195 feet above sea level; 98 miles from London. Equable and mild climate. Average rainfall 24 inches. Mean annual temperature 49·50. Westerly winds prevail.

*Waters.*—Radio-active saline springs, resembling those of Homburg, but more generally useful.

*Therapeutic indications.*—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylopoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension, and chronic interstitial nephritis.

*Baths.*—Turkish, saline, 'whirlpool,' swimming, and electric of all kinds.

(*See also p.* xl).

**Llandrindod Wells (Radnorshire).**—Situated amidst beautiful mountain and river scenery in Mid-Wales at an altitude of 750 feet above sea-level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 35 inches. About 5 hours distant from London, on the main L.M. & S. Railway about mid-way between Shrewsbury and Swansea.

*Waters.*—Celebrated for the variety and efficacy of its numerous medicinal springs. Saline, sulphur and radium-sulphur, magnesium, lithia saline and chalybeate. Slightly aperient and strongly diuretic.

*Therapeutic indications.*—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia or debility from overwork.

*Baths.*—Sulphur, immersion, needle and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; almost every known form of electrical treatment by fully qualified staff.

*Hotel.*—Ye Wells Hotel. (*See p.* 84).

(*See also p.* xli).

**Strathpeffer Spa (Ross-shire. N.B.).**—180 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F.

*Waters.*—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

*Therapeutic indications.*—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, and neurasthenia.

*Baths.*—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

(*See also p.* xli).

**Woodhall Spa (Lincolnshire).**—50 feet above sea level. 3 hours from London. Average rainfall, 22½ inches. The air, bracing and uncontaminated, sweeping across the Lincolnshire wolds from the sea, is soothing and curative, bringing restful sleep to jaded nerves. The quiet simplicity of Woodhall Spa is in itself a distinction.

*Waters.*—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

*Therapeutic indications.*—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders. Not only is Woodhall Spa the place to visit in cases of rheumatism, gout, or any of the diseases mentioned; but those who are suffering from overwork and nerve-strain will find it a delightful holiday resort.

*Spa Baths.*—Recently enlarged. Immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Schnee baths; Dowsing radiant heat and light baths; Bergonié treatment; nose, throat, and eye mineral sprays and douches; Russian and Berthollet vapour; electric, ionic, and $x$-ray treatments; paraffin-wax treatment; massage and Swedish exercises. There are 60 acres of grounds surrounding the Pump Room. Particulars, apply Secretary.

(*See also p.* xlii).

**New Zealand Spas.**—The mineral waters of New Zealand are famed both for their great variety and for their powerful therapeutic properties. Many of them are almost unique: quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than the most famous Continental waters. The principal spas are:—

ROTORUA.—A first-class, well-equipped spa, with complete modern bathing establishment and limitless supply of *Sulphur waters* of two main types: alkaline sulphur, containing sodium chloride, bicarbonate, and silicate; and acid sulphur, containing sulphuric acid, and used for baths only. There are mud baths supplied from the *boiling mud springs*, corresponding to the fango treatment of Italy, and natural vapour baths. The massage and electrical department is thoroughly up to date. The whole establishment is under Government management, and skilled medical attendance is provided. As Rotorua is the centre of the thermal district, numerous minor spas are within easy reach, providing primitive but most excellent baths.

*Climate and Season.*—The latitude corresponds to that of the south of Spain, but the spa being 1000 ft. up, the climate is by no means hot. Season from October to May, but baths open all the year round.

*Accommodation.*—Several hotels and numerous boarding houses.

*Access* by train from Auckland or Wellington.

TE AROHA.—Hot *alkaline waters* of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

*Climate.*—Mild and sedative.

*Accommodation.*—Several hotels and boarding houses.

*Access* by train, branch from Rotorua line.

HANMER.—In the South Island: has mild sulphur baths and a bracing climate.

There are numerous smaller resorts only partly developed, with valuable *iodine, saline, chalybeate, carbonic acid,* and other waters, and a choice of climate from mild subtropical to bracing Alpine.

(*See also p.* xlii).

## OTHER BRITISH SPAS.

**Bridge of Allan (Stirlingshire).**—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 33 inches. Climate mild and equable.

*Waters.*—Natural saline mineral springs (Airthrey).

*Therapeutic indications.*—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

*Baths.*—Excellent suite of baths.

**Church Stretton (Salop).**—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

*Waters.*—Said to be the purest in Great Britain.

*Therapeutic indications.*—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from over-work, and convalescence after illness or operation.

**Ilkley (Yorkshire).**—Situated on the southern slope of the valley of the Wharfe. 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 32 inches. Mean annual temperature, 48° F. Bracing and invigorating moorland air.

*Waters.*—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

*Therapeutic indications.*—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydrotherapeutic.

*Baths.*—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

*Hydropathic Establishment.*—Craiglands Hydropathic. (*See p.* 85).

**Llangammarch Wells (Breconshire).**—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

*Water.*—Saline, containing the chlorides of barium (6¾ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

*Therapeutic indications.*—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

*Hotel.*—Lake Hotel. (*See p.* 84.)

(*See also p.* 84).

**Malvern (Worcestershire).**—520 feet above sea level. 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 27 inches. Mean temperature about 49° F. Sunshine 1700 hours.

*Waters.*—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon.

*Therapeutic indications.*—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

*Baths.*—Natural pure brine (from Droitwich), Turkish and electric baths. Vichy massage and Aix douches, fango-di-Battaglia.

*Hydropathic Establishment.*—The Malvern Hydropathic. (*See p.* **80**).

**Matlock Bath (Derbyshire).**—300 to 800 feet above sea level, 143 miles from London. Average rainfall 36 inches. Mean temperature about 47° F. Very sheltered.

*Waters.*—Thermal springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate.

*Therapeutic indications.*—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

*Baths.*—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

**Matlock Bank** (*Matlock* station, one mile by rail from Matlock Bath).—South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant heat and light, Schnee four-cell, *x* rays, etc. They also include Turkish, Russian, plunge, medicated, and inhalation baths, Aix and Vichy douches.

*Hydropathic Establishment.*—Smedley's Hydropathic (*See p.* **83**).

**Peebles (Peebleshire, N.B.).**—About 500–600 ft. above sea level. One hour from Edinburgh and 382 miles from London. Rainfall, 27 inches. Bracing climate, but sheltered from the north winds.

*Waters.*—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

*Therapeutic indications.*—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

*Baths.*—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

*Hydropathic Establishment.*—Peebles Hotel Hydropathic (*See p.* **81**).

**Ripon (Yorkshire).**—120 feet above sea level. 4¾ hours from London. Climate mild but bracing. Prevailing winds, W. and S.W.

*Waters.*—Saline sulphur water from Aldfield Spa, 4 miles distant.

*Therapeutic indications.* — Chronic and subacute gout, rheumatism, rheumatoid arthritis, chronic skin diseases (eczema, psoriasis, acne), catarrhs, gastric and liver derangements.

*The Baths* have been lately equipped with up-to-date electric apparatus.

**Trefriw Wells (Carnarvonshire).**—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type.

*Waters.*—Two varieties : (1) The aluminous chalybeate, and (2) the sulpho-magnesian chalybeate. Used internally, and externally in the form of baths.

*Therapeutic indications.*—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

**Tunbridge Wells (Kent).**—400 feet above sea level, 1 hour from London. Climate is tonic and invigorating. Prevailing winds W. and S.W.

*Water.*—A weak non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

*Therapeutic indications.*—Waters indicated in anæmia, chlorosis, and allied conditions.

*Baths.*—Immersion, douche, needle, Turkish, Russian, vapour, swimming, medicated, and electric light.

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**Ministry of Health.**—Whitehall, S.W.1. *Minister,* Rt. Hon. Neville Chamberlain, M.P. ; *Permanent Secretaries,* Sir W. A. Robinson, K.C.B., C.B.E. ; Sir A. V. Symonds, K.C.B. ; *Chief Medical Officer,* Sir George Newman, K.C.B., M.D. ; *Senior Medical Officers,* Sir G. S. Buchanan, C.B., M.D., Miss J. M. Campbell, M.D., F. J. H. Coutts, M.D., A W. J. MacFadden, C.B., M.B., R. J. Reece, C.B., M.D., J. S. Whitaker, M.R.C.S. ; *Medical Officers,* E. W. Adams, O.B.E., M.D., M. B. Arnold, M.D., R. Bruce-Low, M.R.C.S., Miss I. D. Cameron, M.D., J. P. Candler, M.D., T. Carnwath, D.S.O., M.B., J. E. Chapman, M.R.C.S., S. A. M. Copeman, M.D., F.R.S., Miss E. C. Creaser, M.B., Miss B. M. Cunningham, O.B.E., M.D., A. Eastwood, M.D., J. Fairley, M.D., J. A. Glover, O.B.E., M.D., M. Greenwood, M.R.C.P., F. Griffith, M.B., J. M. Hamill, O.B.E., M.D., G. C. Hancock, C.B.E., M.R.C.S., F. W. Higgs, C.B.E., M.D., J. R. Hutchinson, M.D., S. P. James, M.D., A. A. Jubb, M.D., J. S. Low, C.B.E., M.B., H. A. Macewen, O.B.E., M.B., G. F. M'Leary, M.D., A. S. MacNalty, M.D., A. MacPhail, M.B., E. P. Manby, M.D., A. C. Parsons, M.R.C.S., J. Pearse, M.D., A. E. Quine, M.B., G. Raffan, M.D., H. M. Richards, M.D., W. M. Scott, M.D., F. R. Seymour, M.D., W. V. Shaw, O.B.E., M.D., A. B. Smallman, C.B.E., D.S.O., M.D., P. G. Stock, C.B., C.B.E., M.B., E. L. Sturdee, O.B.E., M.R.C.S., Miss J. H. Turnbull, C.B.E., M.D., S. W. Wheaton, M.D., F. N. White, C.I.E., M.D., E. Wilkinson, F.R.C.S., G. W. Monier Williams, O.B.E., M.C., D. J. Williamson, M.D., W. P. Yetts, O.B.E., M.R.C.S. *Government Lymph Establishment.*—Colindale Avenue, The Hyde, London, N.W.9.—*Bacteriologist,* F. R. Blaxall, M.D. ; *Assistant Bacteriologists,* H. S. Fremlin, M.R.C.S., and O. K. Wright, M.R.C.S.

**Welsh Board of Health.**—Offices, City Hall, Cardiff. *Members of Board,* Sir Thomas Hughes (*Chairman*), J. Rowland, C.B., C.B.E., M.V.O. ; *Medical Officer,* D. L. Williams, M.C., F.R.C.S. ; *Secretary,* P. E. Watkins.

**Scottish Board of Health.**—121A, Princes Street, and 125, George Street, Edinburgh. *President,* Viscount Novar, G.C.M.G., Secretary for Scotland ; *Vice-President,* J. Kidd, M.P., Parliamentary Under-Secretary for Health ; *Chairman,* Ewan Macpherson, C.B., B.A., ; *Members,* Sir Leslie Mackenzie, M.A., LL.D., M.D., Sir James Leishman, Miss Muriel Ritson ; *Secretary,* John Jeffrey ; *Medical Officers,* Lewis D. Cruickshank, M.D., G. Matheson Cullen, M.D., Thomas F. Dewar, C.B., M.D., D.Sc., Fred. Dittmar, M.A., M.D., G. R. Leighton, O.B.E., M.D., A. Shearer, M.B., C.M., Ernest Watt, M.D., D.Sc. ; *Lady Medical Officer,* Mary J. Menzies, M.B., Ch.B.

**Local Government Board for Ireland.**—Custom House, Dublin. *President,* The Rt. Hon. the Chief Secretary to the Lord Lieutenant of Ireland, for the time being ; *Members of the Board,* The Under-Secretary to the Lord Lieutenant of Ireland, for the time being ; Sir Edward Coey Bigger, M.D. ; Charles H. O'Conor ; *Secretary,* Louis Smith (*Act.*).

**Medical Research Committee.**—15, York Buildings, Adelphi, London, W.C.2. *Secretary,* Sir Walter M. Fletcher, K.B.E., M.D., Sc.D., F.R.S.

**Lunacy Boards.**—

England & Wales—66, Victoria Street, S.W.1. *Sec.,* O. E. Dickinson, Esq.
Scotland—25, Palmerston Place, Edinburgh. *Sec.,* A. D. Wood, Esq., J.P.
Irish Free State—6, 7 & 8, College Green, Dublin. *Inspector,* Thomas I. Considine, F.R.C.S.I.
Northern Ireland—15, Donegall Square, Belfast. *Inspector,* Lt.-Col. W. R. Dawson, O.B.E., M.D.

**Lord Chancellor's Visitors in Lunacy.**—Royal Courts of Justice, Strand, W.C.2. *Visitors,* Lord Sandhurst, Barrister-at-Law ; Sir Robert Armstrong-Jones, C.B.E., M.D. ; and the Masters in Lunacy (*ex officio*). *Sec.,* H. MacDonald ; *Clerk,* W. H. Wade.

**Central Midwives Board.**—England : 1, Queen Anne's Gate Buildings, S.W.1. *Chairman,* Sir F. H. Champneys, Bart, M.D. ; *Secretary,* H. G. Westley, M.A., LL.D. Scotland : 49, Lauriston Place, Edinburgh. *Chairman,* James Haig Ferguson, M.D. : *Secretary,* D. L. Eadie. Ireland : 33, St. Stephen's Green, Dublin. *Chairman,* Sir Edward Coey Bigger, M.D. ; *Secretary,* Joseph E. Devlin.

## EDUCATIONAL VACCINATION STATIONS.

In order to provide for the granting of those Special Certificates of Proficiency in Vaccination which are required to be part of the Medical Qualification for entering into contracts for the performance of Public Vaccination, or for acting as deputy to a Contractor, the following arrangements are made :—

(1) The Vaccination Stations enumerated in the subjoined list are open, under certain specified conditions, for the purposes of Teaching and Examination ;

(2) The Vaccinators officiating at these Stations are authorized to give the required Certificates of Proficiency in Vaccination to persons whom they have sufficiently instructed therein ;

(3) The Vaccinators whose names are printed in italic letters are also authorized to give such Certificates, after satisfactory examination, to persons whom they have not themselves instructed.

| Cities and Towns having Educational Vaccination Stations. | Places used as Educational Vaccination Stations. | Vaccinators authorized to give Certificates of Proficiency in Vaccination. | Days and Hours of Attendance of the Vaccinators at Stations where periodic Courses of Instruction are given (*a*). |
|---|---|---|---|
| **London** | Westminster Hospital<br>St. Thomas's Hospital | A. E. Cope, M.D., 66, Belgrave Rd., S.W.1 | Thursday ; 10.30<br>Tuesday ; 10.30 |
| | 153, Drummond St., N.W.<br>13, Great Alie Street, E. 1 | *J. Loane, M.R.C.P.* 13, Great Alie Street, E.1 | Wed. ; 2<br>Wed. ; 10.30 |
| | Christ Church Mission Hall, Shroton St., Marylebone | E. C. Greenwood, L.R.C.P., 1, Hanover Hse, St. John's Wood, N.W.8 | Fri. ; 3 (beginning in Feb. May & Nov.) |
| | St. John's Vestry Hall, 9, Fair St., S.E.1. | V. A. Jaynes, M.R.C.S., 157, Jamaica Road, Bermondsey, S.E. 16 | Wednesday; 2 (except August) |
| | Royal Free Hospital, Gray's Inn Road, W.C. 1 | Miss G. Dearnley, M.D., 27, Seymour House, Compton St., W.C.1 | Thursday; 10.15 |
| **Birmingham** | 144, Hockley Hill | W. H. Line, M.D., 144, Hockley Hill | * |
| **Bristol** | General Hospital | C. Clarke, M.D., 3, The Fosseway, Clifton | Wednesday ; 11 (Nov. & May) |
| **Cambridge** | Addenbrooke's Hospital | Dr. F. Deighton, Hills Road | * |
| **Leeds** | Leeds General Infirmary | Dr. F. W. M. Greaves, Roundhay Rd. | Thurs. 3 (Oct., Feb., Mar., May, June) |
| **Liverpool** | The School of Hygiene | W. Hanna, M.D., Public Health Dept. | * |
| **Manchester** | St. Mary's Hosp., Whitworth Street West | Dr. A. M. Mitchell, 8, Egerton Rd., Fallowfield | * |
| **Newcastle** | The Dispensary, Nelson St. | *F. Hawthorn, D.S.O., M.D.* 10, Ellison Place | * |
| **Sheffield** | Jessop Hospital for Women | John Chisholm, F.R.C.S. 392, Glossop Road. | * |
| **Cardiff** | University College | E. Emrys-Roberts, M.D., University College | * |
| **Aberdeen** | The Public Dispensary | Dr. John Brown, Hamilton Lodge, Aberdeen | Wednesday ; 3. (during med. sess.) |
| **Dundee** | Royal Infirmary | Dr. D. H. Scott, 10, Aberlemno Ter., Dundee | * |
| **Edinburgh** | Marshall Street Dispensary | W. D. D. Small, M.D. 4, Torphichen Street | Sat. 12 |
| | The Royal Public Dispensary | Dr. R. Aitken, 7, Buccleuch Place | Wed. & Sat. 12 (during med. sess.) |
| | Livingston Memorial Disp. | Dr. J. Young | Tuesday : 3 |
| | New Town Dispensary | 2, Mayfield Gardens | Wednesday ; 3 |
| | Western Dispensary | .. .. .. : .. | Thursday ; 3 |
| **Glasgow** | The Royal Infirmary | Dr. H. H. Borland, 41, Circus Drive, Dennistoun | Monday ; 12 (Men)<br>Thurs. ; 12 (Women) (during med. sess.) |
| | The Western Infirmary | J. L. Carstairs, M.A., M.B. 6, Sardinia Terrace | Mon. & Thurs. ; 12 |
| **Belfast** | City of Belfast Union Infirm. | Dr. J. McLiesh, 91, Great Victoria Street | Wednesday ; 11 |
| **Cork** | Cork District Hospital | W. E. A. Cummins, M.D., 17, St. Patrick's Place | * |
| **Dublin** | 45, Upper Sackville Street | *Dr. A. N. Montgomery,* 45, Upper Sackville Street | Tues., Fri. ; (beginning in Jan., April and Oct.) |
| **Galway** | The Dispensary | Dr. M. J. McDonough, Flood Street | * |

*(a.) Candidates for Certificates should communicate with the authorized Teacher to learn the dates of his or her regular courses of instruction.* * *Days and hours arranged each Session.*

# MEDICAL AND SCIENTIFIC SOCIETIES.

Abernethian Society—St. Bartholomew's Hospital, E.C.1.
Æsculapian Society—Metropolitan Hospital, Kingsland Road, E.8.
Anatomical Society of Great Britain and Ireland—Secretary, John Cameron, M.D., Medical School, Middlesex Hospital, W.1.
Association of British Postal Medical Officers—Sec., 206, Mansfield Road, Nottingham.
Association of Medical Officers of Health—Hon. Sec., —— —— ——
Association of Physicians of Great Britain and Ireland—Secretary, H. M. Fletcher, M.D., 98, Harley Street, W.1.
Association of Public Vaccinators of England and Wales—22, Panmuir Road, S.W.20.
Association of Scottish Medical Diplomates—Hon. Sec., 11, Chandos Street, W.1.
Association of Surgeons of Great Britain and Ireland—Sec., C. H. S. Frankau, C.B.E., D.S.O., 57A, Wimpole Street, W.1.
Assurance Medical Society—Sec., H. W. Collier, M.D., 8, Princes Street, E.C.2.
British Association for the Advancement of Radiology and Physiotherapy—Hon. Secretaries, 12, Stratford Place, W.1.
British Association for the Advancement of Science—Burlington House, W.1.
British Dental Association—Secretary, 23, Russell Square, W.C.1.
British Homœopathic Association (Incorporated)—43, Russell Square, W.C.1.
British Medical Association—Secretary, 429,. Strand, W.C.2.
British Orthopædic Association—Hon. Sec., R. C. Elmslie, O.B.E., M.S., 1A, Portland Place, W.1.
British Oto-Laryngological Society—Sec., 11, Chandos Street, W.1.
British Society for the Study of Orthodontics—Sec., 15, Upper Wimpole Street, W.1.
Chelsea Clinical Society—Sec., 81, Harley Street, W.1.
Chemical Society—Burlington House, Piccadilly, W.1.
Clinical Research Association, Lim.—Watergate House, Adelphi, W.C.2.
Cremation Society of England—52, New Cavendish Street, W.1.
Epsom College (Royal Medical Foundation)—Sec., 49, Bedford Square, W.C.1.
Federation of Medical and Allied Services (Incorporated)—12, Stratford Place, W.1.
Harveian Society of London—Sec., 48, Harley Street, W.1.
Hospital Saturday Fund—Sec., 54, Gray's Inn Road, W.C.1.
Hunterian Society—Sec., 24, Upper Berkeley Street, W.1.
Imperial Cancer Research Fund—Examination Hall, 8-11. Queen Square, W.C.1.
Infirmary Medical Superintendents' Society—Sec., Camberwell Infirmary, S.E.5.
Institute of Hygiene—Sec., 33 and 34, Devonshire Street, W.1.
Listerian Society—King's College Hospital, S.E.5.
London and Counties Medical Protection Society, Lim.—Secs., Hugh Woods, M.D., and A. G. R. Foulerton, O.B.E., F.R.C.S., Victory House, Leicester Square, W.C.2.
London Association of Medical Women—Sec., Mrs. Addison, 125, Harley Street, W.1.
London Dermatological Society—49, Leicester Square, W.C.2.
London Hospital Medical Society—Mile End, E.1.
Medical Abstainers' Association—Hon. Sec., Dr. C. C. Weeks, 55, Paternoster House, E.C.4.
Medical Defence Union, Lim.—Sec., Dr. James Neal, 4, Trafalgar Square, W.C.2.
Medical Officers of Schools' Association—Sec., 11, Chandos Street, W.1.
Medical Practitioners' Union—Sec., 14, Gray's Inn Square, W.C.1.
Medical Sickness, Annuity and Life Assurance Society Lim.—300. High Holborn, W.C.1.
Medical Society for the Study of Venereal Diseases—Sec., 43, Queen Anne Street, W.1.
Medical Society of London—11, Chandos Street, W.1.
Medical Women's Federation—Sec., Miss M. Rew, 9, Clifford Street, W.1.
Medico-Legal Society—11, Chandos Street, W.1.
Medico-Psychological Association—Sec., 11, Chandos Street, W.1.
Metropolitan Police Surgeons' Association—Hon. Sec., 2, Spital Square, E.1.
Middlesex Hospital Medical Society—Hon. Sec., Mortimer Street, W.1.
National Association for the Prevention of Tuberculosis—20, Hanover Square, W.1.
National Council for Combating Venereal Diseases—80, Avenue Chambers, W.C.1.
National Medical Union—11, Chandos Street, W.1.
Ophthalmological Society of the United Kingdom—1, Wimpole Street, W.1.
Pathological Society of Great Britain and Ireland—University College Hosp., W.C.1.
Pharmaceutical Society of Great Britain—17, Bloomsbury Square, W.C.1.
Physiological Society—Sec., St. Thomas's Hospital, S.E.1.
Poor Law Medical Officers' Association of England and Wales—2, Finsbury Sq., E.C.2.
Psycho-Neurological Society—Sec., 19, Cavendish Square, W.1.
Research Defence Society—11, Chandos Street, W.1.
Röntgen Society—Hon. Sec., Dr. R. J. Reynolds, 140, Harley Street, W.1.
Royal Institute of Public Health—37, Russell Square, W.C.1.

Royal Medical Benevolent Fund—11, Chandos Street, W.1.
Royal Sanitary Institute, and Parkes Museum—90, Buckingham Palace Road, S.W.1.
Royal Society of London—Burlington House, Piccadilly, W.1.
Royal Society of Medicine—1, Wimpole Street, W.1., incorporated by Royal Charter, 1834, and Supplemental Charter, 1907, and embracing the following Sections:—Anæsthetical—Balneological and Climatological—Children's Diseases—Clinical—Dermatological—Electro-Therapeutical—Epidemiological and State Medicine—Historical—Laryngological—Medical—Neurological—Obstetrical and Gynæcological—Odontological — Ophthalmological — Orthopædical — Otological — Pathological—Psychiatry—Surgical (with sub-section of Proctology)—Therapeutical and Pharmacological—Tropical Diseases and Parasitology—Urological—War Section.
Royal Society of Tropical Medicine and Hygiene—11, Chandos Street, W.1.
St. Thomas's Hospital Medical and Physical Society—St. Thomas's Hospital, S.E.1.
School Dentists' Society—Sec., 82, St. Mark's Road, Bush Hill Park, Enfield.
Society for the Prevention of Venereal Disease—Hon. Sec., 143, Harley Street, W.1.
Society for the Relief of Widows and Orphans of Medical Men—11, Chandos Street, W.1.
Society for the Study of Inebriety—Hon. Sec., 19, Park Crescent, Portland Place, W.1.
Society of Medical Officers of Health—1, Upper Montague Street, W.C.1.
Society of Members of the Royal College of Surgeons of England—Sec., S. C. Lawrence, M.B., M.R.C.S., 106, Richmond Park Road, Bournemouth.
State Medical Service Association—Sec., 24, Upper Wimpole Street, W.1.
Territorial Force Medical Officers' Association—37, Russell Square, W.C.1.
Tuberculosis Society—Sec., 138, Herbert Road, Woolwich, S.E.18.
United Kingdom Police Surgeons' Association—Hon. Sec., 20, Hagley Road, Edgbaston.
Wellcome Historical Medical Museum—54*a*, Wigmore Street, W.1.
West Kent Medico-Chirurgical Society—Hon. Sec., Dr. C. J. B. Buchan, 326, Brownhill Road, Catford, S.E.6.
West London Medico-Chirurgical Society—West London Hospital, W.6.

## MEDICAL AND SCIENTIFIC PERIODICALS, Etc.

Analyst—Monthly 3/-—W. Heffer & Sons, Cambridge.
Anatomy, Journal of—Quarterly, 40/- per annum—Cambridge University Press, Fetter Lane E.C.4.
Annals of Medical History—Quarterly, 42/- per annum—8, Henrietta Street, W.C.2.
Annals of Surgery—Monthly 4/-—Cassell & Co. Lim., La Belle Sauvage, E.C.4.
Brain—Quarterly 6/-; 24/- per annum—Macmillan, St. Martin's Street, W.C.2.
Bristol Medico-Chirurgical Journal—Quarterly 3/-; 10/6 per annum—J. W. Arrowsmith Ltd., Bristol. (*See Advertisement.*)
British Food Journal and Hygienic Review—Monthly 9d.; 10/6 per annum—22, Northumberland Avenue, W.C.2.
British Journal of Experimental Pathology—Six times per annum for 40/-—Lewis, 136, Gower Street, W.C.1.
British Medical Journal—Weekly 1/3 —429, Strand, W.C.2.
Burdett's Hospitals and Charities—Yearly 17/6—28–29, Southampton Street, W.C.2.
Caledonian Medical Journal—Quarterly 1/6—70, Mitchell Street, Glasgow.
Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital, Chandos Street, W.C.2.
Child, The—Monthly 2/-; 21/- per annum—Bale, 83–91, Great Titchfield Street, W.1.
Children's Diseases, British Journal of—Quarterly 7/6; 25/- per annum—Adlard & Son and West Newman Ltd., 23, Bartholomew Close, E.C.1.
Clinical Journal—Weekly 6d.; 28/6 per annum—H. K. Lewis & Co. Lim., 136, Gower Street, W.C.1.
Clinical Research, Journal of—Quarterly 1/- —The Clinical Research Association Lim., Watergate House, York Buildings, Adelphi, W.C.2.
Dental Journal, British—1st and 15th, 1/- —23, Russell Square, W.C.1.
Dental Record—Monthly, 1/-; 10/6 per annum—Alston House, Newman Street, W.1.
Dental Science, British Journal of—Monthly 9d.; 7/6 per annum—Bale, 83–91, Great Titchfield Street, W.1.
Dental Surgeon—Weekly 4½d.; 20/- per annum—Baillière, 8, Henrietta Street, W.C.2.
Dentists' Register—Yearly 10/6—Constable, 10, Orange Street, W.C.2.
Dermatology, British Journal of—Monthly, 4/-; 42/- per annum—H. K. Lewis & Co. Lim., 136, Gower Street, W.C.1.
Edinburgh Medical Journal—Monthly, 4/- net; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
Glasgow Medical Journal—Monthly 3/-; 30/- per annum—70, Mitchell Street, Glasgow.
Guy's Hospital Gazette—Fortnightly 9d.; 10/- per annum—Ash & Co. Lim., Henry Street, Bermondsey, S.E.1.

Guy's Hospital Reports—Quarterly, 12/6 net ; 42/- per annum—Henry Frowde and Hodder & Stoughton, 1, Bedford Street, Strand, W.C.2.
Heart : A Journal for the Study of the Circulation—Quarterly, 37/6 per annum—Shaw & Sons, Lim., 7, Fetter Lane, E.C.4
Homœopathic Journal, British—Quarterly, 3/6—Bale, 83–91, Gt. Titchfield Street, W.1.
Homœopathic World—Monthly 9d. ; 10/– per annum—12A, Warwick Lane, E.C.4. (*See Advertisement.*)
Hospital and Health Review—Monthly, 6d ; 7/6 per annum—28, 29, Southampton Street, W.C.2. (*See Advertisement.*)
Hygiene, Journal of—Quarterly, 12/6—Cambridge University Press, Fetter Lane, E.C.4.
Indian Medical Gazette—Monthly, Rs. 16 per annum—Thacker & Co., 2, Creed Lane, E.C.4. (*See Advertisement.*)
Inebriety, British Journal of—Quarterly 2/6 —Baillière, 8, Henrietta Street, W.C.2.
Irish Journal of Medical Science (Official Organ of the Royal Academy of Medicine in Ireland)—Monthly, 2/6—40, Lower Ormond Quay, Dublin. (*See Advertisement.*)
Laboratory and Clinical Medicine, Journal of—Monthly, 36/– per annum—Kimpton, 263, High Holborn, W.C.1.
Lancet—Weekly 1/– ; 42/– per annum—423, Strand, W.C.2. (*See Advertisement.*)
Laryngology and Otology, Journal of — Monthly 4/– ; 40/– per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
Laryngoscope, The—Monthly, 35/– per annum—Baillière, 8, Henrietta Street, W.C.2.
London Hospital Gazette—Monthly 1/– ; 10/– per annum—5, Rupert Street, E.1.
Masseuses and Masseurs, Register of—Yearly, 3/6—157, Great Portland Street, W.1.
Maternity and Child Welfare—Monthly 1/- ; 10/6 per annum—Bale, 83–91, Great Titchfield Street, W.1.
Medical Annual—Yearly 20/– net ; Subscribers before publication 17/– net, post free—John Wright & Sons Lim., Bristol.
Medical Directory—Yearly 36/– net—Churchill, 7, Great Marlborough Street, W.1.
Medical Officer — Weekly 1s. ; 42/– per annum (and Supplement monthly : The Jennerian)—36–38, Whitefriars Street, E.C.4. (*See Advertisement.*)
Medical Press and Circular—Weekly 6d. ; 21/– per annum—Baillière, 8, Henrietta Street, W.C.2. (*See Advertisement.*)
Medical Register—Yearly 21/– —Constable, 10, Orange Street, W.C.2.
Medical Review—Monthly 2/6 ; 30/– per annum—70, Finsbury Pavement, E.C.2.
Medical Science, Abstracts and Reviews—Monthly, 3/– ; 30/– per annum—Oxford University Press, Amen Corner, E.C.4.
Medical Temperance Review—Quarterly 6d.—23, Bartholomew Close, E.C.1.
Medical Times—Monthly, 6d. ; 6/– per annum—49 & 50, Watling Street, E.C.4.
Medical World—Weekly 1/– ; 52/– per annum—14, Gray's Inn Suare, W.C.1.
Medical and Dental Students' Register—Yearly 2/6—10, Orange Street, W.C.2.
Mental Science, Journal of—Quarterly 7/6—7, Great Marlborough Street, W.1.
Middlesex Hospital Journal—Six issues, 1/– each—Middlesex Hospital, W.1.
Midland Medical Journal—Monthly 4d.—Birmingham Printers Lim., Birmingham.
Mind—Quarterly, 4/6 ; 16/– per annum—Macmillan, St. Martin's Street, W.C.2.
Midwives' Roll—Yearly 42/– —Spottiswoode, 1, New Street Square, E.C.4.
National Medical Journal—National Medical Union, 11, Chandos Street, W.1.
Neurology and Psychiatry, Review of—30/– per annum—15, Frederick Street, Edinburgh.
Neurology and Psychopathology, Journal of—Quarterly, 8/6 net ; 30/– per annum—Wm. Heinemann Ltd., 20, Bedford St., W.C.2.
Obstetrics and Gynæcology of the British Empire, Journal of—Quarterly 12/6—34, Cross Street, Manchester.
Obstetrics and Gynecology, The American Journal of—Monthly, 36/– per annum—Kimpton, 263, High Holborn, W.C.1.
Ophthalmology, British Journal of—Monthly, 5/– ; 42/– per annum—Pulman & Sons Lim., 24, Thayer Street, W.1.
Orthodontia, Oral Surgery and Radiography, International Journal of—Monthly, 36/– per annum—Kimpton, 263, High Holborn, W.C.1.
Parasitology—Quarterly 15/-—Cambridge University Press, Fetter Lane, E.C.4.
Pathology and Bacteriology, Journal of—Quarterly, 40/– per annum—Oliver & Boyd, Edinburgh.
Physiological Abstracts—Monthly, 42/– per annum—136, Gower Street, W.C.1.
Physiology (Experimental), Quarterly Journal of—30/– per volume—Chas. Griffin & Co. Lim., Exeter Street, W.C.2.
Physiology, Journal of—Quarterly, 30/– per volume—Fetter Lane, E.C.4.
Practitioner—Monthly 4/– ; 42/– per annum—2, Howard Street, Strand, W.C.2. (*See Advertisement.*)
Prescriber—Monthly, 2/– ; 20/– per annum—6, South Charlotte Street, Edinburgh. (*See Advertisement.*)

Psyche—Quarterly, 5/– net—68–74, Carter Lane, E.C.
Psychology, British Journal of—Quarterly (Medical Section), 30/–; (General Section), 30/– net per volume—Cambridge University Press, Fetter Lane, E.C.4.
Public Health—Monthly 2/6; 31/6 per annum—1, Upper Montague Street, W.C.1.
Quarterly Journal of Medicine—Quarterly 10/6; 35/– per annum—Oxford University Press, Amen Corner, E.C.4.
R.A.M.C., Journal of the—Monthly 2/– —Bale, 83–91, Great Titchfield Street, W.1.
Radiology and Electrotherapy, Archives of—Monthly 4/–; 42/– per annum—Wm. Heinemann Ltd., 20, Bedford Street, W.C.2.
Röntgen Society, Journal of the—Quarterly 5/– net; 20/– per annum—Percy Lund, Humphries & Co. Lim., 3, Amen Corner, E.C.4.
Royal Naval Medical Service, Journal of the—Quarterly, 6/– net; 20/– per annum—83–91, Great Titchfield Street, W.1.
Royal Sanitary Institute, Journal of the—Six times per annum for 13/6—12, Long Acre, W.C.2.
Royal Society of Medicine, Proceedings of the—Monthly 10/6 net; 105/– per annum—Longmans, Green & Co., 39, Paternoster Row, E.C.4.
School Hygiene—Quarterly 1/6—23, Bartholomew Close, E.C.1.
South African Medical Record—Fortnightly 1/3; 31/6 per annum—Baillière, 8, Henrietta Street, W.C.2.
St. Bartholomew's Hospital Journal—Monthly 9d.; 7/6 per annum—Students' Union, St. Bartholomew's Hospital, E.C.1.
St. George's Hospital Gazette—5/– per annum—83–91, Great Titchfield Street, W.1.
St. Mary's Hospital Gazette—Monthly, 10/– per annum—56, Porchester Road, W.2.
St. Thomas's Hospital Gazette—Six times per annum for 7/6—St. Thomas's Hospital, S.E.1.
St. Thomas's Hospital Reports—Yearly 8/6—7, Great Marlborough Street, W.1.
State Medicine, Journal of—Monthly, 2/– —Bale, 83–91, Gt. Titchfield Street, W.1.
Surgery, British Journal of—Quarterly, 12/6 net; 42/– per annum—John Wright & Sons Lim., Bristol. (*See Advertisement.*)
Surgery, Gynæcology, and Obstetrics, and International Abstract of Surgery—Monthly 7/6; 75/– per annum—Baillière, 8, Henrietta Street, W.C.2.
Syphilis, The American Journal of—Quarterly, 42/– per annum—Kimpton, 263, High Holborn, W.C.1.
Tropical Diseases Bulletin—Monthly, 2/6; 25/– per annum—23, Endsleigh Gardens, N.W.1.
Tropical Medicine and Hygiene, Journal of—Fortnightly 1/6; 30/– per annum—Bale, 83–91, Great Titchfield Street, W.1.
Tropical Medicine and Hygiene, Year Book of—Yearly 7/6—Bale, 83–91, Great Titchfield Street, W.1.
Tropical Medicine and Parasitology, Annals of—Quarterly, 7/6; 22/6 per annum—177, Brownlow Hill, Liverpool.
Tubercle—Monthly 2/6; 25/– per annum—Bale, 83–91, Great Titchfield Street, W.1.
Tuberculosis, British Journal of—Quarterly 2/6—Baillière, 8, Henrietta Street, W.C.2. (*See Advertisement.*)
University College Hospital Magazine—Oct. to March, 7/– per annum—Bale, 83–91, Great Titchfield Street, W.1.
West London Medical Journal—Quarterly 2/——83–91, Great Titchfield Street, W.1.
Westminster Hospital Reports—Once in two years, 6/– net—20, Warwick Square, E.C.4.

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Evans, A. E., 38, Fitzroy Street, W.1
Grossmith, W. R. Lim., 12, Burleigh St., Strand, W.C.2
Haywood, J. H. Lim., Castle Gate, Nottingham
Pache & Son, 75, Station St., Birmingham

### Bandages and Antiseptic Dressings.

Braid, A. E. & Co. Lim., 30, Gower Place, Gower Street, W.C.1
Grout & Co. Lim. (Inc. The Norwich Crape Co. (1856), Lim.), Great Yarmouth
Robinson & Sons Lim., Chesterfield

### Bottle Manufacturers and Merchants.

Beatson, Clark & Co. Lim., Rotherham
Isaacs, I. & Co., The North London Glass Bottle Works, 106, Midland Road, N.W.1 (Dispensing Bottles)

### Dietetic Articles (Manufacturers of).

Brand & Co. Lim., Mayfair Works, Vauxhall, S.W.8
Brown, Gore & Co., 40, Trinity Square, E.C.3 (Gautier Frères' Brandy)
Cadbury Bros. Lim., Bournville, Birmingham
Camwal Lim., 112, Pembroke Street, N. (Waters)
Fletcher, Fletcher & Co. Lim., Thane Rd., Holloway, N.7
Ingram, Crane & Co., Lim., 2–4, Billiter Avenue, E.C. (Wines and Spirits)
Ingram & Royle Lim., Bangor Wharf, 45, Belvedere Road, S.E.1 (Waters)
Oxo Lim., Thames House, E.C.4
Rattray, A. Dewar, 188, Dumbarton Road, Partick, Glasgow (Wines and Spirits)
Thew, Hooker & Gilbey Lim., Buckingham
Valentine's Meat-Juice Co., Richmond, Virginia, U.S.A.

### Druggists (Principal Wholesale).

Allen & Hanburys Lim., 37, Lombard Street, E.C.3, and 7, Vere Street, W.1
Alliance Drug & Chemical Co., 10, Beer Lane, Great Tower Street, E.C.3
Anglo-French Drug Co. Lim., 238a, Gray's Inn Road, W.C.1
Biozone Lim., 9–10, Fenchurch Street, E.C.3
Boots Pure Drug Co. Lim., Station Street, Nottingham
British Colloids Lim., (The Crookes Laboratories), 22, Chenies Street, W.C.1.
British Dyestuffs Corporation Lim., 70, Spring Gardens, Manchester
Burroughs Wellcome & Co., Snow Hill Buildings, E.C.1
Chinosol Hygiene Co., 48, Cranwich Road, N.16
Clayton Aniline Co. Lim., 68½, Upper Thames Street, E.C.4
Drug and Chemical Corporation Lim., "Daccol" Laboratories, 41, Lower Kennington Lane, S.E.11
Duncan, Flockhart & Co., 104–108, Holyrood Road, Edinburgh, and 155, Farringdon Road, London
Fellows Medical Mfg. Co., Incorporated, 26, Christopher Street, New York
Ferris & Co. Lim., Bristol
Fletcher, Fletcher & Co. Lim., Thane Road, Holloway, N.7
Genatosan, Lim., 143, Great Portland Street, W.1
Giles, Schacht & Co., Clifton, Bristol
Guyot-Guenin & Son, 67, Southwark Bridge Road, S.E.
Handford & Dawson, Harrogate
Harris (Philip) & Co. (1913) Lim., Edmund Street, Birmingham
Hewlett, C. J. & Son Lim., 35–42, Charlotte Street, E.C.2
Hoffmann-La Roche Chemical Works Lim., 7 and 8, Idol Lane, E.C.3
Howards & Sons Lim., Ilford, E.
Kerol Lim., Castlegate, Newark (Disinfectant)
Kolynos Incorporated, 156–157, Aldersgate Street, E.C.1 (Dental Cream)
Martindale, W., 10, New Cavendish Street, W.1
Maw, S., Son & Sons Lim., 7–12, Aldersgate Street, E.C.1
May, Roberts & Co. Lim., 9–11, Clerkenwell Road, E.C.1
Midgley, Chas. Lim., Manchester
Modern Pharmacals Lim., 2, Calthorpe Street, W.C.1
Newbery, F. & Sons Lim., Charterhouse Square, E.C.1
Parke, Davis & Co., 50–54, Beak Street, Regent Street, W.1
Peat Products (Sphagnol) Lim., 18 & 19, Queenhithe, Upper Thames St., E.C.4
Phillips (Chas. H.) Chemical Co., 14, Henrietta Street, W C.2
Reynolds & Branson Lim., 13, Briggate, Leeds
Richards, John Morgan & Sons Lim., 46–47, Holborn Viaduct, E.C.1
S. P. Charges Co., St. Helens, Lancs.
Saltrates Lim., Euston Buildings, N.W.1
Savory & Moore Lim., 143, New Bond Street, W.1
Southall Bros. & Barclay Lim., Birmingham.
Squire & Sons Lim., 413, Oxford Street, W.1
Sumner, R. & Co. Lim., 40, Hanover Street, Liverpool
Whiffen & Sons Lim., Lombard Road, Battersea, S.W.11
Willows, Francis, Butler & Thompson Lim., 40, Aldersgate Street, E.C.1
Woolley, Jas., Sons & Co. Lim., Victoria Bridge, Manchester
Wyleys Lim., Coventry

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City Sale & Exchange, 54, Lime Street, E.C.3. (Microscopes)
Cox-Cavendish Electrical Co. Lim., 105, Great Portland Street, W.1
Dean, A. E. & Co., Leigh Place, Brooke Street, Holborn, E.C.1
Flatters & Garnett Lim., 309, Oxford Road, Manchester
Mottershead & Co., 7, Exchange Street, Manchester
Newton & Wright Lim., 471–473, Hornsey Road, N.19; Showrooms: 48, Wigmore Street, W.1
Rogers Electric Sales Co., 180, Gray's Inn Road, W.C.1
Siemens Brothers & Co. Lim., Woolwich, S.E.18

### Hospital Bed and Furniture Manufacturers.

A. Collier, Lane End, High Wycombe, Bucks (Invalid Chairs)
Hoskins & Sewell Lim., Birmingham

### Motor Car Manufacturers and Agents, and Accessories.

Brown Bros. Lim., Great Eastern Street, E.C.2
Henly, H. G. & Co., 91, Great Portland Street, W.1
Standard Motor Co. Lim., Coventry

### Opticians.

Bruce, Green & Co. Lim., 14–18, Bloomsbury Street, W.C.1
Davidson, F. & Co., 29, Great Portland Street, W.1.
Spiller, Geo., Lim., 32, Wigmore St., W.1
Zeal, G. H. Lim., 82, Turnmill Street, E.C.1

### Printers (Medical).

Bale, John Sons & Danielson Lim., 83–91, Great Titchfield Street, W.1
Cassell & Co. Lim., La Belle Sauvage, Ludgate Hill, E.C.4
Wright, John & Sons Lim., Bristol

### Publishers and Booksellers (Medical).

Adlard & Son and West Newman Lim., 23, Bartholomew Close, E.C.1
Allen (Geo.) & Unwin Lim., 40, Museum Street, W.C.1
Appleton, D. & Co., 25, Bedford Street, Covent Garden, W.C.2
Arnold, Edward & Co., 41 & 43, Maddox Street, W.1
Baillière, Tindall & Cox, 8, Henrietta Street, W.C.2
Bale, John Sons & Danielsson Lim., 83–91, Great Titchfield Street, W.1
Black, A. & C., Lim., Soho Square, W.1
Bryce, William, 54 & 54a, Lothian Street, and 15 & 16, Teviot Place, Edinburgh (Bookseller)
Butterworth & Co., Bell Yard, Temple Bar, W.C.2
Cambridge University Press (C. F. Clay), Fetter Lane, E.C.4
Cassell & Co. Lim., La Belle Sauvage, Ludgate Hill, E.C.4
Churchill, J. & A., 7, Great Marlborough Street, W.1
Constable & Co. Lim., 10–12, Orange Street, W.C.2
Cornish Bros. Lim., 39, New Street, Birmingham
Ellis, H. R., 9, Lovell's Court, Paternoster Row, E.C.4 (Bookseller)
Fannin & Co. Lim., Grafton Street, Dublin (Booksellers)
Foyle, W. & G. Lim., 121–125, Charing Cross Road, W.C.2 (Booksellers)
Galloway, James, 3, Teviot Place, Edinburgh (Bookseller)
Green, W. & Son Lim., St. Giles Street, Edinburgh
Griffin, Chas. & Co. Lim., 12, Exeter Street, Strand, W.C.2
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Lewis, H. K. & Co. Lim., 136, Gower Street, & 24 & 28, Gower Place, W.C.1
Lippincott, J. B. Co., 16, John Street, Adelphi, W.C.2
Livingstone, E. & S., 16 & 17, Teviot Place, Edinburgh
Longmans, Green & Co., 39, Paternoster Row, E.C.4
Maclehose, Jackson & Co., 73, West George Street, Glasgow
Macmillan & Co. Lim., St. Martin's Street, W.C.2
Murray, John, 50a, Albemarle Street, W.1
Oliver & Boyd, Tweeddale Court, Edinburgh
Oxford Medical Publications (Henry Frowde and Hodder & Stoughton), 1 & 2, Bedford Street, Strand, W.C.2
Oxford University Press (Humphrey Milford), Amen Corner, E.C.4
Paul (Kegan), Trench, Trubner & Co. Lim., 68–74, Carter Lane, E.C.4
Pulman, Geo. & Sons Lim., 24, Thayer Street, W.1
Putnam's, G. P., Sons, Lim., 24, Bedford Street, W.C.2
Saunders, W. B. Co., Lim., 9, Henrietta Street, W.C.2
Scientific Press Lim., 28 and 29, Southampton Street, W.C.2
Shaw & Sons Lim., 7–9, Fetter Lane, E.C.4
Sherratt & Hughes, University Press, 34, Cross Street, Manchester
Simpkin, Marshall, Hamilton, Kent & Co. Lim., Stationers' Hall Court and Paternoster Row, E.C.4
Thacker, W. & Co., 2, Creed Lane, E.C.4 (Thacker, Spink & Co., Calcutta)
Thin, James, 54–56, South Bridge, Edinburgh (Bookseller)
University of London Press Lim., 17, Warwick Square, E.C.4
Wright, John & Sons Lim., Bristol (and Printers); London Depôt, Stationers' Hall Court, E.C.4

### Shelters for Open-air Treatment.

Beattie, G. W., 189, Upper Richmond Road, Putney, S.W.15
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Dunsheath, H. & Co., Arundel Street, Sheffield

### Surgical and Medical Instrument and Appliance Manufacturers.

Alexander & Fowler, 104 and 106, Pembroke Place, Liverpool
Allen & Hanburys Lim., 48, Wigmore Street, W.1
Ash, Claudius Sons & Co. Lim., 5–12, Broad Street, Golden Square, W.1

Bailey, W. H. & Son Lim., 45, Oxford St., W.1, and 2, Rathbone Place, W.1
Bell (John) & Croyden Lim. (incorporating Arnold & Sons), 50, Wigmore Street, W.1, and Giltspur Street, E.C.1
Braid, A. E. & Co. Lim., 30, Gower Place, Gower Street, W.C.1
Critchley, J. & Sons, 18, Great George Street, Liverpool
Curtis, H. E. & Son Lim., 8, Old Cavendish Street, W.1
Cuxson, Gerrard & Co. Lim., Oldbury, Birmingham
De Trey & Co. Lim., 23, Swallow Street, Piccadilly, W.1 (Dental)
Dent, R. H. (Acoustique), 95, Wigmore Street, W.1
Dental Manufacturing Co. Lim., Alston House, Newman Street, W.1
Domen Belts Co. Lim., 456, Strand, W.C.2
Down Bros. Lim., 21 & 23, St. Thomas's Street, S.E.1
Dowsing Radiant Heat Co. Lim., 91 & 93, Baker Street, W.1
Evans, A. E., 38, Fitzroy Street, W.1
Ferris & Co. Lim., Bristol
Gardner, J. & Son, 32, Forrest Road, Edinburgh
Genito-Urinary Mfg. Co. Lim., 66, Margaret Street W.1
Grossmith, W. R. Lim., 12, Burleigh Street, Strand, W.C.2
Harris (Philip) & Co. (1913) Lim., Edmund Street, Birmingham
Hawksley & Sons, 351, Oxford Street, and 83, Wigmore Street, W.1
Haywood, J. H. Lim., Castle Gate, Nottingham
Holborn Surgical Instrument Co. Lim., 26, Thavies Inn, E.C.1
Holland, T. & Son, 46, South Audley St., W.1 (Foot Supports)
Hospitals Contracts Co. Lim., 25–35, Mortimer Street, W.1
Lewbart Manufacturing Co. Lim., 2 & 3, Norfolk Street, W.C. (Disinfectors)
Maw, S., Son & Sons Lim., 7–12, Aldersgate Street, E.C.1
Mayer & Phelps, 59 & 61, New Cavendish Street, W.1
Medical Supply Association Lim., 167–185, Gray's Inn Road, W.C.1
Millikin & Lawley, 165, Strand, W.C.2
Montague, J. H., 69, New Bond Street, W.1
Morison, Robert, 2, Lauriston Terrace, Edinburgh
Reynolds & Branson Lim., 13, Briggate, Leeds
Salmon Ody Lim., 7, New Oxford Street, W.C.1 (Trusses and Foot Supports)
Salt & Son Lim., 5 & 6, Cherry Street, Birmingham
Sumner, R. & Co. Lim., 40, Hanover Street, Liverpool
Surgical Manufacturing Co., Lim., 83–85, Mortimer Street, W.1
Tintometer (The) Lim., Salisbury
Weiss, John & Son Lim., 287, Oxford Street, W.1
Woolley, Jas. Sons & Co. Lim., Victoria Bridge, Manchester
Young, Arch. & Son, 57–61, Forrest Road, Edinburgh

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Dr. Doucet's Calf Lymph. Sole Agents for Great Britain and Ireland : Archd. Young & Son, 57–61, Forrest Road, Edinburgh
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# NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. If entered in the following pages any note can be immediately found when required.

1923

| JANUARY. | | | | | |
|---|---|---|---|---|---|
| S | • | 7 | 14 | 21 | 28 |
| M | 1 | 8 | 15 | 22 | 29 |
| Tu | 2 | 9 | 16 | 23 | 30 |
| W | 3 | 10 | 17 | 24 | 31 |
| Th | 4 | 11 | 18 | 25 | • |
| F | 5 | 12 | 19 | 26 | • |
| S | 6 | 13 | 20 | 27 | • |

## *NOTES.*

Copy here any formula or fact you wish to keep for reference.

1923

| FEBRUARY. | | | | | |
|---|---|---|---|---|---|
| S | • | 4 | 11 | 18 | 25 |
| M | • | 5 | 12 | 19 | 26 |
| Tu | • | 6 | 13 | 20 | 27 |
| W | • | 7 | 14 | 21 | 28 |
| Th | 1 | 8 | 15 | 22 | • |
| F | 2 | 9 | 16 | 23 | • |
| S | 3 | 10 | 17 | 24 | • |

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We are continually saving Medical Clients large amounts. Actual savings effected during 1922 include £220—£178—£121—£75—£56 and numerous other sums. We prepare your returns, check your assessments, claim and invariably secure your over-payments. In fact we relieve you of all the bother and worry and put money in your pocket. Seek our advice on all taxation matters as we specialise in the Medical branch. Specimen sheet of our "Simplex" Doctor's Account Book free on request. Call, write, or 'phone Holborn 6659.

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1923

| MARCH. | | | | | |
|---|---|---|---|---|---|
| S | * | 4 | 11 | 18 | 25 |
| M | * | 5 | 12 | 19 | 26 |
| Tu | * | 6 | 13 | 20 | 27 |
| W | * | 7 | 14 | 21 | 28 |
| Th | 1 | 8 | 15 | 22 | 29 |
| F | 2 | 9 | 16 | 23 | 30 |
| S | 3 | 10 | 17 | 24 | 31 |

## NOTES.

1923

| APRIL. | | | | | |
|---|---|---|---|---|---|
| S | 1 | 8 | 15 | 22 | 29 |
| M | 2 | 9 | 16 | 23 | 30 |
| Tu | 3 | 10 | 17 | 24 | * |
| W | 4 | 11 | 18 | 25 | * |
| Th | 5 | 12 | 19 | 26 | * |
| F | 6 | 13 | 20 | 27 | * |
| S | 7 | 14 | 21 | 28 | * |

THE CHARTER OF
DR BARNARDO'S HOMES
IS
"NO DESTITUTE CHILD EVER REFUSED ADMISSION."
HEAD OFFICES:—18–26 STEPNEY CAUSEWAY, LONDON, E. 1
*See Advertisement, p.* xlvi.

1923

MAY.

| | | | | | |
|---|---|---|---|---|---|
| S | • | 6 | 13 | 20 | 27 |
| M | • | 7 | 14 | 21 | 28 |
| Tu | 1 | 8 | 15 | 22 | 29 |
| W | 2 | 9 | 16 | 23 | 30 |
| Th | 3 | 10 | 17 | 24 | 31 |
| F | 4 | 11 | 18 | 25 | • |
| S | 5 | 12 | 19 | 26 | • |

## NOTES.

1923

JUNE.

| | | | | | |
|---|---|---|---|---|---|
| S | • | 4 | 11 | 18 | 25 |
| M | • | 5 | 12 | 19 | 26 |
| Tu | • | 6 | 13 | 20 | 27 |
| W | • | 7 | 14 | 21 | 28 |
| Th | 1 | 8 | 15 | 22 | 29 |
| F | 2 | 9 | 16 | 23 | 30 |
| S | 3 | 10 | 17 | 24 | • |

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**Surgeons' Opticians, Patentees & Manufacturers,**
— *GOLD MEDAL, 1913* —
**32 WIGMORE STREET, LONDON, W.1**
See Advertisement, page xv. Phone: Mayfair 636, 648.

1923

| JULY. | | | | | |
|---|---|---|---|---|---|
| S | 1 | 8 | 15 | 22 | 29 |
| M | 2 | 9 | 16 | 23 | 30 |
| Tu | 3 | 10 | 17 | 24 | 31 |
| W | 4 | 11 | 18 | 25 | • |
| Th | 5 | 12 | 19 | 26 | • |
| F | 6 | 13 | 20 | 27 | • |
| S | 7 | 14 | 21 | 28 | • |

## *NURSES.*

Note whether Midwifery or Sick Nurses, their terms and addresses

1923

| AUGUST. | | | | | |
|---|---|---|---|---|---|
| S | • | 5 | 12 | 19 | 26 |
| M | • | 6 | 13 | 20 | 27 |
| Tu | • | 7 | 14 | 21 | 28 |
| W | 1 | 8 | 15 | 22 | 29 |
| Th | 2 | 9 | 16 | 23 | 30 |
| F | 3 | 10 | 17 | 24 | 31 |
| S | 4 | 11 | 18 | 25 | • |

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**VICHY-CÉLESTINS**

For GOUT, RHEUMATISM, INDIGESTION, and AFFECTIONS OF THE LIVER AND STOMACH.

*See Advertisement, page* 590.

1923

| SEPTEMBER. | | | | | | |
|---|---|---|---|---|---|---|
| S | • | 2 | 9 | 16 | 23 | 30 |
| M | • | 3 | 10 | 17 | 24 | • |
| Tu | • | 4 | 11 | 18 | 25 | • |
| W | • | 5 | 12 | 19 | 26 | • |
| Th | • | 6 | 13 | 20 | 27 | • |
| F | • | 7 | 14 | 21 | 28 | • |
| S | 1 | 8 | 15 | 22 | 29 | • |

# *ADDRESSES (PRIVATE).*

1923

| OCTOBER. | | | | | |
|---|---|---|---|---|---|
| S | • | 7 | 14 | 21 | 28 |
| M | 1 | 8 | 15 | 22 | 29 |
| Tu | 2 | 9 | 16 | 23 | 30 |
| W | 3 | 10 | 17 | 24 | 31 |
| Th | 4 | 11 | 18 | 25 | • |
| F | 5 | 12 | 19 | 26 | • |
| S | 6 | 13 | 20 | 27 | • |

BISEDIA

*See full announcement on page lii.*

An Elegant and Effective Preparation for
GASTRO-INTESTINAL
DISTURBANCE COMPLICATED
WITH VOMITING.

GILES, SCHACHT & CO., CLIFTON, BRISTOL.

1923

| NOVEMBER. | | | | | |
|---|---|---|---|---|---|
| 𝔖 | • | 4 | 11 | 18 | 25 |
| M | • | 5 | 12 | 19 | 26 |
| Tu | • | 6 | 13 | 20 | 27 |
| W | • | 7 | 14 | 21 | 28 |
| Th | 1 | 8 | 15 | 22 | 29 |
| F | 2 | 9 | 16 | 23 | 30 |
| S | 3 | 10 | 17 | 24 | • |

# NOTES.

1923

| DECEMBER. | | | | | | |
|---|---|---|---|---|---|---|
| 𝔖 | • | 2 | 9 | 16 | 23 | 30 |
| M | • | 3 | 10 | 17 | 24 | 31 |
| Tu | • | 4 | 11 | 18 | 25 | • |
| W | • | 5 | 12 | 19 | 26 | • |
| Th | • | 6 | 13 | 20 | 27 | • |
| F | • | 7 | 14 | 21 | 28 | • |
| S | 1 | 8 | 15 | 22 | 29 | • |

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1924

| JANUARY. | | | | | |
|---|---|---|---|---|---|
| S | • | 6 | 13 | 20 | 27 |
| M | • | 7 | 14 | 21 | 28 |
| Tu | 1 | 8 | 15 | 22 | 29 |
| W | 2 | 9 | 16 | 23 | 30 |
| Th | 3 | 10 | 17 | 24 | 31 |
| F | 4 | 11 | 18 | 25 | • |
| S | 5 | 12 | 19 | 26 | • |

## NOTES.

1924

| FEBRUARY. | | | | | |
|---|---|---|---|---|---|
| S | • | 3 | 10 | 17 | 24 |
| M | • | 4 | 11 | 18 | 25 |
| Tu | • | 5 | 12 | 19 | 26 |
| W | • | 6 | 13 | 20 | 27 |
| Th | • | 7 | 14 | 21 | 28 |
| F | 1 | 8 | 15 | 22 | 29 |
| S | 2 | 9 | 16 | 23 | • |

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Comprising, **No. 1**: Visiting List, Case Record, and Prescription Card; **No. 2**: Ledger Card; and a set of coloured Guide Cards. Size of Cards 8 in. × 5 in. Also well-made handsome **Cabinets**, in polished oak, with brass fittings, having one or two drawers, as desired.

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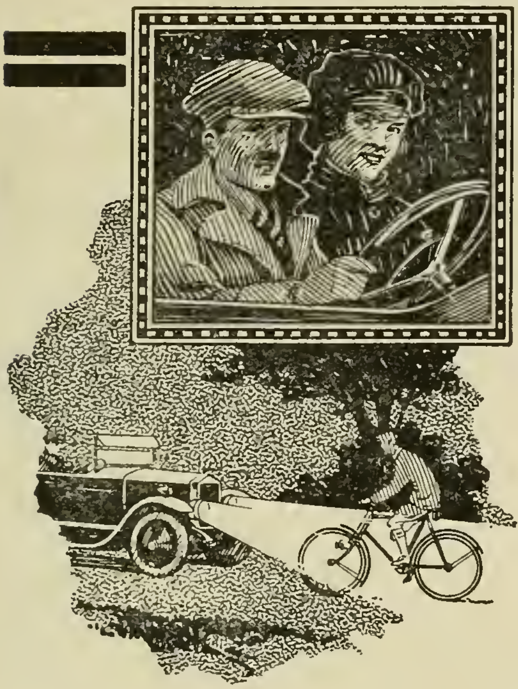

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Speed!
DUCO
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| | | | | | £ |
| Abstainers and General Insurance Co., Ltd., Edmund St., Birmingham. *Man. Director,* H. J. Greening .. .. P | 1883 | 40/11 | 55/10 | 82/3 | 1,457,607 |
| Alliance Assurance Co. Ltd., Bartholomew Lane, E.C. *Gen. Man.,* O. Morgan Owen P | 1824 | 48/9 | 64/5 | 90/9 | *18,177,743 |
| Atlas Assurance Co. Ltd., 92, Cheapside, E.C. 2. *Gen. Man.,* C. H. Falloon. *Act.,* William Penman .. .. .. P | 1808 | 49/3 | 63/7 | 88/8 | 3,231,389 |
| **Australian Mutual Provident Society,** Life, Endowments and Annuities, 73-76, King William Street, E.C.4. *Manager* for U.K., W. C. Fisher. **Further particulars see page 9** .. .. .. M | 1849 | 48/2 | 64/5 | 89/10 | 46,711,178 |
| **Britannic Assurance Co. Ltd.,** Life, Endowment Assurances, House Purchase, Broad St. Corner, Birmingham. *Chairman,* J. A. Patrick, J.P. *Secretary,* J. M. Laing F.I.A. **Further particulars see page 8** P | 1866 | 47/9 | 64/- | 91/1 | 7,200,000 |
| British Equitable Assurance Co. Ltd., 1, 2, 3, Queen Street Place, E.C. *Manager,* Basil May, F.I.A. .. .. .. P | 1854 | 48/8 | 64/11 | 91/9 | 1,465,501 |
| Caledonian Insurance Co., 19, George Street, Edinburgh. *Gen. Man.,* R. Hill Stewart, F.F.A. London Offices, 82, King William St., E.C., and 14, Waterloo Place, S.W. P | 1805 | 48/9 | 64/6 | 88/6 | *4,089,502 |
| Canada Life Assurance Co., 15, King Street, Cheapside, E.C. *Man.,* J. R. Wandless. F.I.A. .. .. .. P | 1847 | 48/5 | 65/4 | 94/2 | 15,889.766 |
| City Life Assurance Co. Ltd., 6, Paul Street, Finsbury, E.C. *Man. Dir.,* Leonard Aldridge | 1897 | 47/10 | 64/8 | 92/5 | *1,156,947 |
| Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W., and 8, King William Street, E.C. *Gen. Man. & Act.,* A. D. Besant .. .. P | 1824 | 50/11 | 69/2 | 99/8 | 7,004,254 |
| Colonial Mutual Life Assurance Society Ltd., 33, Poultry, E.C. *Man.,* Arthur E. Gibbs. *Assist. Man.,* Ernest A. Cawdron M | 1873 | 48/9 | 65/1 | 89/10 | 6,144,000 |
| Commercial Union Assurance Co. Ltd., 24, 25, and 26, Cornhill, E.C. *Act.,* A. G. Allen P | 1861 | 47/10 | 65/2 | 92/4 | 9 318,345 |
| **Co-operative Insurance Society Ltd.,** 109, Corporation Street, Manchester. *Man.,* J. P. Jones. **Further particulars see page 10** .. .. .. M | 1867 | 47/4 | 63/1 | 90/1 | 1,632 490 |
| **Eagle Star & British Dominions Insurance Co. Ltd.** Head Office, British Dominions House, Royal Exchange Avenue, E.C. 3; Life Dept., 32, Moorgate, E.C. 2. *Man. Dir.,* Sir Edward M. Mountain, Bart, J.P. **Further particulars see page 7** P | 1807 | 49/9 | 66/3 | 93/8 | 13,572,655 |
| Equitable Life Assurance Society, Mansion House Street, E.C.2. *Act. & Man.,* W. Palin Elderton, F.I.A... .. M | 1762 | 54/- | 68/- | 92/- | 5,249,511 |
| **Equity & Law Life Assurance Society,** 18, Lincoln's Inn Fields, W.C. *Man. & Sec.,* W. P. Phelps, M.A., F.I.A. **Further particulars see page 11** .. P | 1844 | 48/10 | 64/6 | 90/9 | 5,088,115 |
| **Friends' Provident & Century Life Office,** 42, Kingsway, W.C.2. and 18 Charlotte Square, Edinburgh. *Gen. Man.,* Henry J. Tapscott. *Act.,* Alfd. Moorhouse, F.I.A. **Further particulars see page 11.** M | 1832 | 48/- | 64/3 | 89/9 | 3,730,601 |

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†The Legal and General Assurance are not for the present issuing Policies under *with* Profit tables.

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|---|---|---|---|---|---|
| | | | | | £ |
| General Accident Fire and Life Assurance Corporation Ltd., Perth, Scotland. *Gen. Man.*, F. Norie-Miller, J.P. .. P | 1885 | 49/2 | 64/11 | 91/3 | 401,849 |
| **General Life Assurance Co.**, 103, Cannon Street, E.C. 4. *Sec.*, Albert Burton Nye. Further particulars see page 10 P | 1837 | 49/10 | 65/4 | 92/8 | 1,975.234 |
| Gresham Life Assurance Society Ltd., St. Mildred's House, Poultry, E.C. 2. *Gen. Man. & Sec.*, Alexander Lawson .. P | 1848 | 47/6 | 62/10 | 88/6 | 6,394,942 |
| Guardian Assurance Co. Ltd., 68, King William Street, and 21 Fleet St., E.C. *Gen. Man.*, Geo. W. Reynolds. *Act.*, W. P Cook P | 1821 | 48/10 | 64/6 | 89/3 | 4.796,490 |
| Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C. *Sec.*, J. Stirling P | 1806 | 48/4 | 64/- | 89/10 | 8,849,109 |
| †Legal & General Assurance Society Ltd., 10, Fleet St., E.C. *Gen. Man.*, W. A. Workman P | 1836 | 38/9 | 53/3 | 77/4 | 14 037,856 |
| Life Association of Scotland, 82, Princes St., Edinburgh. *Man. & Act.*, R. M. M[illegible]dick. *Sec.* Alex. Prentice. London Office, 28, Bishopsgate, E.C. *Sec.*, G. S. N. Carter, F.I.A. .. .. .. | 1838 | 48/11 | 64/10 | 91/1 | 5,522,354 |
| Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool. *Gen. Man & Sec.*, Hugh Lewis. London Office, 1, Cornhill, E.C. .. .. P | 1836 | 49/10 | 65/9 | 91/3 | 5,450,745 |
| London and Scottish Assurance Corporation Ltd., 66–67, Cornhill, E.C. *Gen. Man.*, W. Æneas Mackay. *Sec.*, Louis I. Jarvis. *Jnt. Asst. Secs.*, E. E. Dent and L. C. Kestin. *Act.*, Harold Dougharty .. .. P | 1862 | 48/9 | 64/9 | 91/2 | 4,440,141 |
| London Assurance Corporation, 1, King William St., E.C. *Man.* of Life Dept. and *Act.*, A. G. Hemming, F.I.A. .. P | 1720 | 49/- | 64/8 | 90/2 | 3,155.338 |
| London Life Association, Ltd., 81, King William Street, E.C. *Act. & Man.*, H. M. Trouncer, M.A., F.I.A. .. M | 1806 | 47/- | 61/8 | 85/4 | 6,960,721 |
| Marine and General Mutual Life Assurance Society, 14, Leadenhall Street, E.C. *Act. & Sec.*, Howard T. Cross, F.I.A. M | 1852 | 48/10 | 65/- | 91/6 | 2,354,662 |
| Medical Sickness Annuity & Life Assurance Society Ltd., 300, High Holborn, W.C. *Man. & Sec.*, Bertram Sutton, F.C.I.I. M | 1884 | 40/2 | 55/3 | 80/- | *330,000 |
| Metropolitan Life Assurance Society, 13, Moorgate, E.C. 2. *Act. & Man.*, H. J. Baker, F.I.A. .. .. .. M | 1835 | 49/9 | 66/4 | 92/- | 2,303.298 |
| Mutual Life and Citizens' Assurance Co. Ltd. (of Australia). Effingham Ho., 1, Arundel St. W.C. *Man.*, Alex. S. Sellar, M.A., F.F.A. P | 1886 | 48/9 | 65/3 | 89/9 | 12,510,142 |
| Mutual Life Insurance Co. of New York, 7 & 8, Norfolk Street, Strand, W.C. 2. *Gen. Man.*, J. H. Harrison Hogge. *Sec.*, L. A. Mumford M | 1843 | 48/9 | 66/- | 97/- | 136,928,412 |
| National Mutual Life Assurance Society, 39, King Street, Cheapside, E.C. *Act. & Man.*, G. Marks, C.B.E., F.I.A. *Asst. Act.*, H. G. Sharp, F.I.A. *Sec.*, G. V. S. Booth. M | 1830 | 48/4 | 63/7 | 89/6 | 3,432,255 |
| National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. *Man.*, H W. Meyers. M | 1869 | 46/8 | 61/6 | 87/2 | 15,101 000 |
| National Provident Institution, 48, Gracechurch Street, E.C. *Act. & Sec.*, L. F. Hovil, F.I.A. .. .. M | 1835 | 50/2 | 66/3 | 91/1 | 7.799,173 |
| New York Life Insurance Co., Trafalgar Buildings, Trafalgar Square, London, W.C. *Gen. Man.*, E. H. Krause. *Sec.*, Wm. R. Collinson F.C.I.S. .. M | 1845 | 48/9 | 66/- | 96/11 | 205,500,000 |
| North British and Mercantile Insurance Co. Ltd. 61, Threadneedle St., E.C. 2, & 64, Princes St., Edinburgh. *Gen. Man.*, London, Sir A. Worley, C.B.E. *Gen. Man.*, Edin., Owen D. Jones .. .. P | 1809 | 49/10 | 66/1 | 91/11 | 18,866,307 |

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| TITLE, ETC., OF OFFICE. | A | B | C | D | E |
|---|---|---|---|---|---|
| Northern Assurance Co. Ltd., 1, Moorgate Street, E.C. *Joint Gen. Managers*, H. Gayford, J. Robertson .. .. P | 1836 | 49/- | 64/8 | 90/10 | £<br>4,814,062 |
| Norwich Union Life Insurance Society, Norwich. *Gen. Man. & Act.*, Davidson Walker. *Sec.*, M. Mackenzie Lees. London Office, 49, Fleet Street, E.C.4. M | 1808 | 45/8 | 59/6 | 85/3 | 10,002,306 |
| Pearl Assurance Co. Ltd., 252, High Holborn, W.C.1. *Man'g Director*, G. Shrubsall, J.P. P | 1864 | 49/- | 65/- | 92/- | 20,816,834 |
| Phœnix Assurance Co. Ltd., Phœnix House, King William St., E.C. 4. Trafalgar House, Waterloo Place, S.W. 1, & 187, Fleet Street, E.C. 4. *Gen. Man.*, R. Y. Sketch. P | 1782 | 48/11 | 64/7 | 90/8 | 11,680,227 |
| Provident Mutual Life Assurance Association, 25 to 31, Moorgate, E.C. 2. *Man. & Act.*, C. R. V. Coutts .. .. M | 1840 | 51/- | 68/- | 95/- | *3,000,000 |
| **Prudential Assurance Co. Ltd**, Holborn Bars. *Sec.*, Sir George May, K.B.E. Further particulars see page 9 P | 1848 | 49/6 | 65/11 | 91/11 | 128,137,178 |
| Refuge Assurance Co. Ltd., Oxford Street, Manchester. *Gen. Mans.*, J. Proctor Green and W. H. Aldcroft. London Office, 133, Strand, W.C. .. .. .. P | 1864 | 49/3 | 65/9 | 91/9 | *19,061,052 |
| Royal Exchange Assurance, Royal Exchange, E.C. 3, and 44, Pall Mall, S.W. 1. *Act.*, T. F. Anderson, F.I.A., F.F.A. .. P | 1720 | 49/- | 64/9 | 90/2 | 5,298,362 |
| Royal Insurance Co. Ltd., 1, North John St., Liverpool. *Gen. Man.*, J. J. Atkinson. London Offices, 24–28, Lombard Street. *London Man.*, R. M'Connell .. P | 1845 | 48/8 | 64/4 | 90/4 | 14,006,051 |
| Scottish Amicable Life Assurance Society, St. Vincent Place, Glasgow. *Gen. Man.*, W Hutton. *Sec. & Act.*, R. Gordon-Smith. London Office, 1, Threadneedle St., E.C. *Sec.* H. Robertson .. .. M | 1826 | 51/9 | 66/3 | 90/1 | *7,104,973 |
| Scottish Equitable Life Assurance Society, 28, St. Andrew Square, Edinburgh. *Gen. Man.*, C. Guthrie. *Sec. & Act.*, J. M. Warden. London Office, 13, Cornhill, E.C. 3. *Sec.*, P. W. Purves. .. .. M | 1831 | 50/- | 65/5 | 90/6 | 6,643 494 |
| Scottish Life Assurance Co. Ltd., 19, St. Andrew Square, Edinburgh. *Man.*, Lewis P. Orr, F.R.S.E. London Office, 9 & 10, King St., E.C. *Sec.*, L. Campbell P | 1881 | 49/5 | 64/6 | 90/5 | 3.239,198 |
| Scottish Provident Institution, 6, St. Andrew Square, Edinburgh. *Man.*, R. T. Boothby. *Joint Secs.*, C. W. Thomson, & A. Graham Donald. *Act.*, W. G. Walton. London Offices, 3, Lombard St. E.C., and 17, Pall Mall, S.W. .. .. M | 1837 | 42/4 | 56/6 | 83/2 | 17,000,000 |
| Scottish Temperance & British General Assurance Co., Ltd., 107, St. Vincent Street, Glasgow. *Manager*, Adam K. Rodger. London, 2, 3 & 4, Cheapside. *Man.*, R. J. Moss. *Less 10 per cent to Abstainers* P | 1883 | 48/6 | 63/9 | 89/10 | 3,392 091 |
| Scottish Union & National Insurance Co., 35, St. Andrew Square, Edinburgh. *Gen. Man.*, J. A. Cook. London Office, 5, Walbrook, E.C. 4. *Sec.*, James G. Nicoll .. P | 1824 | 50/- | 65/8 | 92/- | 8,691,392 |
| Scottish Widows' Fund Life Assurance Society, 9, St. Andrew Square, Edinburgh. *Man. & Act.*, G. J. Lidstone. *Sec.*, Geo. C. Stenhouse. London Offices, 28, Cornhill, E.C.3, and 17, Waterloo Place, S.W.1 M | 1815 | 51/9 | 66/3 | 90/7 | 22,806,536 |
| Standard Life Assurance Co., 3, George Street, Edinburgh. *Man.*, S. E. Macnaghten. London Offices, 110, Cannon Street, E.C. *Sec.*, A. B. Drayton, and 15a, Pall Mall *Sec.*, E. V. Goodall .. .. P | 1825 | 48/11 | 64/5 | 89/- | 13,550,000 |

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| Title, Etc., of Office. | A | B | C | D | E |
|---|---|---|---|---|---|
| | | | | | £ |
| Sun Life Assurance Society, 63, Threadneedle Street, E.C. *Sec. & Gen. Man.*, E. Linnell. *Act.*, R. G. Salmon, F.I.A. *Assistant Sec.*, G. M. Searle, F.I.A. P | 1810 | 49/2 | 66/6 | 94/2 | 13,283,577 |
| Sun Life Assurance Co. of Canada, Canada House, 4 & 5, Norfolk Street, W.C. *Man.*, J. F. Junkin .. .. .. P | 1865 | 48/5 | 65/4 | 94/1 | 25,800,042 |
| United Kingdom Provident Institution, 196, Strand, W.C. *Sec.*, H. W. Hasler. *Act.*, C. Cosmo Monkhouse. B.A., F.I.A. *Asst. Act.* W. G. Barrett, F.I.A. M | 1840 | 50/3 | 66/7 | 92/7 | 11,000,000 |
| University Life Assurance Society, 25, Pall Mall, S.W.1. *Act. & Sec.*, R. Todhunter, M.A. .. .. .. P | 1825 | 52/4 | 68/9 | 94/10 | 937,369 |
| **Wesleyan & General Assurance Society,** Life, Annuities, Sickness, Assurance Buildings, Steelhouse Lane, Birmingham. *Gen. Man.*, A. L. Hunt. London Office, Halton House, 20–23, Holborn, E.C. 1. Further particulars see page 8 .. M | 1841 | 48/1 | 65/8 | 93/10 | 4,341,918 |
| **Yorkshire Insurance Company, Ltd.,** Chief Offices: St. Helen's Square, York. Bank Buildings, Princes Street, E.C. 2. *London Branches*, 17, Mincing Lane, E.C. 3; 48, Pall Mall, S.W.1; 49, Sloane Square, S.W. 1; 132, Newington Causeway, S.E. 1; 6, Norfolk Street, Strand, W.C. 2; 43, Broadway, Stratford, E 15; 551, High Road, Tottenham, N.17; 280, Euston Road, N.W.1. Further particulars, page 2 P | 1824 | 49/1 | 64/9 | 91/7 | 3,598,311 |

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Ad. 4

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**GEORGE A. ARNAUDIN,** *Secretary-Superintendent.*

# ROYAL EYE HOSPITAL.

## London School of Ophthalmic Surgery and Medicine,

### ST. GEORGE'S CIRCUS, SOUTHWARK, S.E.1.

*Consulting Surgeon*—Sir W. J. COLLINS, K.C.V.O., M.D., M.S., B.SC., F.R.C.S.
*Surgeons*—L. VERNON CARGILL, F.R.C.S.; G. BROOKSBANK JAMES, F.R.C.S.; ARTHUR D. GRIFFITH, M.B., B.S., F.R.C.S.; E. ARTHUR DORRELL, F.R.C.S.
*Assistant Surgeons*—T. WILFRED LETCHWORTH, M.B., B.C., F.R.C.S.; A. E. A. LOOSELEY, M.B., B.CH., F.R.C.S.
*Physician*—JAMES COLLIER, M.D., B.SC., F.R.C.P.
*Dean*—A. D. GRIFFITH, M.B., B.S., F.R.C.S.

Lectures, Clinical Demonstrations, Instruction in Refraction Work, and Instruction in Pathology, &c., are given by the Teaching Staff of the Hospital. Clinical Instruction is given daily in the Out-Patient Department at 2 p.m. There are annually more than 22,000 new patients attending the Hospital, and excellent opportunity is afforded to Practitioners and Medical Students to acquire a practical knowledge of Ophthalmology.

The instruction at the School is recognized by the University of London and the Royal Colleges of Physicians and Surgeons for the purposes of their examinations in Ophthalmology. For further particulars apply to the Dean.

# THE HOSPITAL FOR SICK CHILDREN,

### GREAT ORMOND STREET, W.C. 1.

Clinical Instruction is given daily by Members of the Visiting Staff in the Wards, Out-patient Department, Operating Theatre and Post-mortem Room.

Clinical Clerkships and Dresserships in the Wards and Clinical Assistantships in the Out-patient Department are also available for Students and Post-Graduates, both men and women. Two months of the time spent as Clerks or Dressers by Undergraduate Students is recognized by the Universities of London, Oxford, Cambridge, etc., and by the conjoint Examination Board of England for their final examinations.

**Fees for Hospital Attendances:** One Month's Ticket, **£2 2s.** Three Months' Ticket, **£5 5s.** Perpetual Ticket, **£10 10s.**

Special Reduced Fee for Clinical Clerks for one month, **£1 1s.**

Further particulars may be obtained from the Secretary or the Dean.

**O. L. ADDISON, F.R.C.S.,** *Dean to the Medical School.*
**WILFRED J. PEARSON, D.M.,** *Sub-Dean to the Medical School.*

# HOSPITAL for CONSUMPTION & DISEASES OF THE CHEST, Brompton

### and SANATORIUM at FRIMLEY.

Students and qualified men are admitted to the practice of the Hospital and the lectures on payment of a Fee of One Guinea for One Month; Two Guineas for Three Months. Clinical Assistants to the Out-Patients' Department are appointed for Six Months, and are expected to join the practice of the Hospital for that period. A certificate is given to those who have attended a six months' course with satisfaction. The Hospital practice includes outpatient and in-patient clinics. Demonstrations in the Clinical Laboratory, Museum and Special Departments, and Artificial Pneumothorax.

*Full particulars can be obtained from* - **L. S. BURRELL,** *Dean.*

# ROYAL NORTHERN GROUP OF HOSPITALS

**HOLLOWAY :: CITY ROAD :: SOUTHGATE :: CLACTON**

THE Largest General Hospital Organization in North London. Seventeen special departments for the treatment of special diseases. At the service of 1,000,000 people in an area of 70 square miles.

**375 Beds. Over 3,000 In-Patients, and 181,000 Out-Patient Attendances Annually.**

The main Hospital at Holloway has general, contributory, and private Wards, and is recognized by the Examining Board of the Royal Colleges of Physicians and Surgeons as a place of study during the 5th year of the medical curriculum.

**FUNDS ARE URGENTLY NEEDED.**

GILBERT G. PANTER, *Secretary*,
ROYAL NORTHERN HOSPITAL,
HOLLOWAY. N.7.

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# SCHOOL OF MEDICINE
OF
# THE ROYAL COLLEGES, EDINBURGH.

(FOUNDED 1505.)

## WINTER SESSION, 1922-1923,
**Opens 10th OCTOBER.**

THE Lectures qualify for the English and Scottish Universities and other Medical Examining Boards.

One half of the Qualifying Classes required for graduation in the University of Edinburgh may be attended in this School.

The School offers a large choice of Teachers upon the various subjects comprised in the Medical Curriculum.

The Calendar of the School, giving all necessary information regarding Classes, Fees, and Examinations, will be published on September 15th; a copy may be obtained (price 6d.) on application to the DEAN OF THE SCHOOL, 11, Bristo Place, Edinburgh.

# UNIVERSITY OF BRISTOL.

## FACULTY OF MEDICINE.

THE University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board, etc., for Medical Degrees or Diplomas. The Dental and Public Health Departments afford the necessary instruction for the Degrees and Diplomas of the University and of other examining bodies in those subjects.

**The University confers the following Degrees and Diplomas :**

| | |
|---|---|
| Bachelor of Medicine and Bachelor of Surgery | M.B., Ch.B. |
| Master of Surgery .. .. .. .. .. | Ch.M. |
| Doctor of Medicine .. .. .. .. .. | M.D. |
| Doctor of Philosophy .. .. .. .. | Ph.D. |
| Bachelor of Dental Surgery .. .. .. | B.D.S. |
| Master of Dental Surgery .. .. .. .. | M.D.S. |
| Diploma in Dental Surgery .. .. .. | L.D.S. |
| Diploma in Public Health .. .. .. .. | D.P.H. |

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. Moreover, the Dental student may in seven years take both Dental and Medical degrees. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by skilled mechanics.

**CLINICAL WORK** is done at the Bristol Royal Infirmary, and the Bristol General Hospital, which together contain 618 beds. The Bristol Royal Hospital for Sick Children and Women (108 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, and the Bristol City Fever Hospital are also open for the clinical instruction of students.

**SCHOLARSHIPS.**—There is no entrance scholarship, but students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the City Scholarship Committee.

Several Scholarships and Prizes are open to students during their Hospital career.

**HOSPITAL APPOINTMENTS** open to students after qualification.

At the Bristol Royal Infirmary.—Two House Surgeons, two House Physicians (of these one is chosen as Senior Resident Officer) one Resident Obstetric Officer, one Throat, Nose and Ear House Surgeon, one Ophthalmic House Surgeon, one Casualty Officer, and one Dental House Surgeon.

At the Bristol General Hospital.—One Senior House Surgeon one Casualty House Surgeon, two House Physicians, one House Surgeon, and one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the Dean of the Faculty of Medicine.

# UNIVERSITY OF DURHAM

## COLLEGE OF MEDICINE, NEWCASTLE-ON-TYNE.

Degrees in Medicine, Surgery and Hygiene: Diplomas in Public Health and Psychiatry, and Licence in Dental Surgery.—Seven Degrees, two Diplomas, and one Licence are conferred by the University of Durham—*viz.*, the Degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, and Doctor of Surgery; Bachelor of Hygiene, and Doctor of Hygiene; the Diplomas in Public Health and Psychiatry, and the Licence in Dental Surgery. These Degrees, etc., are open to Men and Women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees, except in the case of Practitioners of more than fifteen years' standing, who, having attained the age of forty years, can obtain the Degree of M.D. after examination only.

The first three Examinations for the Degrees of M.B. and B.S. may be passed prior to the commencement of attendance at Newcastle.

A candidate who has passed the First and Second Examinations of the University will be exempt from the First and Second Examinations of the Conjoint Board in England, and will be entitled to present himself for the Final Examination of the Board on the completion of the necessary curriculum. Students who have satisfied the requirements of the General Medical Council as regards Registration, in some Examination other than the Durham Matriculation, or its equivalent, may enter on a course of study for a degree in Medicine upon satisfying the Examiners of the University of Durham in *three* of the subjects of the Matriculation Examination (exclusive of Religious Instruction and Elementary Mathematics), provided that one of them is a language other than English. In the case of a Student who spends only one year at Newcastle, the necessary subjects of the Matriculation Examination must be passed at least 12 months previously to the candidate's entry for his Final Examination for the Degrees. N.B.—On and after 1st January, 1923, new Regulations regarding Matriculation will come into force.

Students can complete, at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees, and for the Diplomas in Public Health and Psychiatry; also for the examinations of the Royal Colleges of Physicians and Surgeons, and for the Army and Navy Examination Boards.

A Dental curriculum is provided, and a Licence in Dental Surgery may be obtained after Examination.

All information is given in the Calendar of the University, which may be obtained from the Registrar at the College, price 3/6, per post 4d.

**Scholarships, &c.**—University of Durham Scholarship, value £100 for proficiency in Arts, awarded annually to full students in their first year only. The Pears Scholarship—value £150—for proficiency in Arts. Dickinson Scholarship—value the interest of £400, and a Gold Medal—for Medicine, Surgery, Midwifery, and Pathology. Tulloch Scholarship—value the interest of £400—for Anatomy, Biology, Chemistry, and Physics. Charlton Scholarship—value the interest of £700—for Medicine. Gibb Scholarship—value the interest of £500—for Pathology. Luke Armstrong Scholarship—interest on £680—for comparative Pathology. Stephen Scott Scholarship—interest on £1000—for Surgery. Heath Scholarship—the interest on £4000 for Surgery, to be awarded every second year. Philipson Scholarships (2)—interest of £1800, to be awarded in connection with the Final M.B., B.S. Examinations in March and June. Gibson Prize—value the interest of £250 Stock—for Midwifery and Diseases of Women and Children. The Turnbull Prize and Medal—for Surface Anatomy. The Outterson Wood Prize—value the interest of £250—for Psychological Medicine. The Goyder Memorial Scholarship (at the Infirmary)—value the interest of £325—for Clinical Medicine and Clinical Surgery. At the end of each Session, a Prize of Books is awarded in each of the regular Classes. Assistant Demonstrators of Anatomy, Prosectors, and Assistant Physiologists are elected yearly. Pathological Assistants, Assistants to the Dental Surgeon, Assistants in the Eye Department, Clinical Clerks and Dressers are appointed every three months.

The Royal Victoria Infirmary contains 600 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given as opportunity offers, by the Pathologist; Practical Midwifery can be studied at the Newcastle Maternity Hospital, where there is an outdoor practice of over 1000 cases annually.

### FEES.

(*a*) A Composition Ticket for Lectures at the College may be obtained—

I.—By payment of £122 on entrance.

II.—By payment of £82 at the commencement of the First Year, and £54 at the commencement of the Second Year.

III.—By three annual instalments of £61 10s., £47 10s., and £41 respectively, at the commencement of the Sessional year.

(*b*) Fees for attendance on Hospital Practice:—

For 3 Months' Medical and Surgical Practice, £12 12s. For 6 months', £15 15s. For 1 year's, £21. For Perpetual, £46; or by two instalments—First year, £26; Second year, £23.

In addition to the above fees, the Committee of the Royal Victoria Infirmary require the payment of 2 guineas yearly up to three years from every Student attending the Infirmary. For six months, or any shorter period, this fee is 1 guinea. After three years of attendance, such payment will be no longer necessary.

(*c*) Single courses of Lectures, £6 16s. 6d.

(*d*) A Composition Ticket for the courses of Lectures and Practical work of the first two years of the curriculum, may be obtained by the payment of £68 on entrance.

(*e*) Composition fee for Lectures, etc., at College for Licence in Dental Surgery, £57 10s. Composition fee for Practical work at Dental Hospital, £60 4s. if paid in one sum; or £62 6s. if paid in two instalments.

(*f*) Composition fee for courses of instruction for the Diploma in Psychiatry, £35.

Fees for Lectures, etc., at the College and for Hospital Practice, must be paid to the Registrar; and fees for Practical Dental Work to the Dean of the Dental Hospital—at the time of entry.

Further particulars may be obtained from the Registrar, PROF. HOWDEN, at the College.

# UNIVERSITY OF EDINBURGH.

## SESSION 1922-23.

*Principal*—Sir J. ALFRED EWING, K.C.B., M.A., D.Sc., LL.D., F.R.S.

**The WINTER SESSION, 1922-23, opens on 10th October, and closes 16th March.**
**The SUMMER SESSION, 1923, opens on 1st May, and closes 13th July.**

## FACULTY OF MEDICINE.

*Dean*—Professor J. LORRAIN SMITH, M.A., M.D., F.R.S.

The Faculty embraces 19 Chairs and 65 Lectureships; and attached to these Chairs there are about 40 Assistants and Demonstrators. Instruction is given in all the main branches of Medical Science, viz.

### PROFESSORS:

*Chemistry*—George Barger, D.Sc., F.R.S.
*Zoology*—J. Cossar Ewart, M.D., F.R.S.; J. H. Ashworth, D.Sc., F.R.S.
*Botany*—Wm. Wright Smith, M.A., F.R.S.
*Anatomy*—Arthur Robinson, M.D.
*Physiology*—Sir E. S. Schafer, LL.D., F.R.S.
*Materia Medica*—A. R. Cushny, M.D., LL.D., F.R.S.
*Pathology*—J. Lorrain Smith, M.D., F.R.S.
*Bateriology*—James Ritchie, M.D.
*Forensic Medicine*—Harvey Littlejohn, M.B., B.Sc.
*Public Health*—C. Hunter Stewart, M.B., D.Sc.
*Medicine*—Geo. Lovell Gulland, C.M.G., M.D.
*Surgery*—Alexis Thomson, C.M.G., M.D., B.Sc.
*Midwifery and Gynecology*—Benjamin P. Watson, M.D. [C.M.
*Clinical Surgery*—Sir H. J. Stiles, K.B.E., M.B.,
*Clinical Medicine*—Edwin Bramwell, M.D.; Geo. Lovell Gulland, C.M.G., M.D.; J. C. Meakins, M.D.
*Tuberculosis*—Sir Robert W. Philip, M.D.
*Therapeutics*—J. C. Meakins, M.D.
*Psychiatry*—George M Robertson, M.D.

### UNIVERSITY LECTURERS:

*Clinical Surgery*—Alexis Thomson, C.M.G., M.D., C.M.; Sir David Wallace, C.M.G., M.B., C.M.; Alexander Miles, M.D., C.M.; J. W. Dowden, M.B., C.M.; A. A. Scot Skirving, C.M.G., M.B., C.M.; G. L. Chiene, M.B., C.M.
*Clinical Medicine*—R. A. Fleming, M.D.; Harry Rainy, M.A., M.D.; D. Chalmers Watson, M.D.; Edwin Matthew, M.D.; W. T. Ritchie, M.D.
*Clinical Gynæcology*—J. Haig Ferguson, M.D.; William Fordyce, M.D.
*Midwifery (to Women)*—J. W. Ballantyne, M.D.
*Diseases of the Eye*—J. V. Paterson, M.B., C.M.; A. H. H. Sinclair, M.D.
*Clinical Instruction in Diseases of Children*—J. Stewart Fowler, M.D.; John Fraser, M.D.; Charles McNeil, M.D.; N. S. Carmichael, M.B., Ch.B.
*Anatomy*—E. B. Jamieson, M.D.
*Applied Anatomy*—F. E. Jardine, M.B.
*Histology*—R. K. S. Lim, M.B., Ph.D.
*Physiological Chemistry*—W. W. Taylor, D.Sc.
*Experimental Physiology*—May L. Walker, M.A., B.Sc., M.B.
*Physiology of the Nervous System*—A. Ninian Bruce, M.D., D.Sc.
*Experimental Pharmacology*—W. C. Sillar, M.D. B.Sc.
*Pathology, Practical*—F. E. Reynolds, M.B.
*Morbid Anatomy*—W. A. Alexander, M.B.
*Physics*—G. A. Carse, M.A., D.Sc.
*Diseases of the Larynx, Ear and Nose*—A. Logan Turner, M.D.; John S. Fraser, M.B.; John D. Lithgow, M.B.
*Tropical Diseases*—D. G. Marshall (Lt.-Col., I.M.S.)
*Med. Entomology and Parasitology*—J. H. Ashworth, D.Sc., F.R.S.; W. S. Patton (Major I.M.S.)
*Tropical Hygiene*—J. B. Young, M.B., D.Sc. (conjointly with Professor).
*Diseases of the Skin*—Norman Walker, M.D.; Frederick Gardiner, M.D.
*Clinical Instruction in Infectious Fevers*—Alexander James, M.D.; Claude B. Ker, M.D.
*History of Medicine*—J. D. Comrie, M.A., B.Sc., M.D.
*Neurology*—
*Surgical Pathology*—J. M. Graham, M.B., Ch.M.
*Practical Anæsthetics*—J. Stuart Ross, M.B., Ch.B. (Demonstrator).
*Venereal Diseases*—David Lees, M.B.
*Psychology*—J. Drever, M.A., B.Sc., D.Phil.

Practical Instruction is afforded, under the superintendence of the Professors, in Laboratories with the necessary appliances, and in Tutorial and Practical Classes connected with the above Chairs, and opportunities are afforded to Students to extend their practical knowledge and engage in original research. Opportunities for Hospital Practice are afforded at the Royal Infirmary, the Hospital for Sick Children, Maternity Hospital, the City Fever Hospital, and the Asylum for the Insane. Upwards of 2760 beds are available for the Clinical Instruction of Students of the University. Four Degrees in Medicine and Surgery are conferred by the Univ. of Edinburgh, viz.; Bachelor of Med. (M.B.), Bachelor of Surg. (Ch.B.), Doctor of Med. (M.D.), and Master of Surg. (Ch.M.). The minimum Class Fees for M.B. and Ch B., including Hospital Fee (£12), amount to about £200, and the Matric. and Exam. Fees to £45 3s. An additional Fee of £21 is payable by those who proceed to M.D., and £21 by those who proceed to Ch.M. The annual value of the Bursaries, Prizes, Scholarships, and Fellowships in the Faculty of Med. amounts to about £3,600, and that of the other Bursaries, etc., tenable by Students of Med., amounts to about £1,820.

Courses of instruction are given for the Degrees of B.Sc. and D.Sc. in Public Health and for the University Diplomas in Public Health, Tropical Medicine and Hygiene, and Psychiatry. These Diplomas are open to approved registered practitioners as well as to graduates in Medicine and Surgery of the University.

The University also takes part in the Courses given under the auspices of the Edinburgh Post Graduate Courses in Medicine. In the departments of the Faculty of Medicine, provision is made for research by students of graduate standing.

In the University Laboratories facilities will be provided for candidates for the Degree of Ph.D. whose applications to engage in research have been accepted by the Senatus.

A Syllabus and further information as to Matriculation, the Curricula of Study for Degrees, etc., may be obtained from the Dean of the Faculty of Medicine, and for Degrees in the Faculties of Arts, Science, Divinity, Law, and Music, from the Deans of these Faculties; or from the Registrar, and full details are given in the University Calendar, published by James Thin, 55, South Bridge, Edinburgh. Price by post, 6s. By Authority of the Senatus,

*July*, 1922. WILLIAM WILSON, *Secretary*.

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# UNIVERSITY OF LIVERPOOL

## FACULTY OF MEDICINE.

The University grants degrees in Medicine, Surgery, Hygiene, Orthopædic Surgery, Dental Surgery, and Veterinary Science, also degree of Doctor of Philosophy, and Diplomas in Public Health, Tropical Medicine, Veterinary Hygiene, Medical Radiology and Electrology, and a Licence in Dental Surgery.

Students may also prepare in the University for the examinations of other licensing bodies.

*Medical School Buildings.*—The buildings of the Medical School are all modern, and contain spacious lecture rooms, and well-equipped laboratories and class-rooms for the study of all the more important subjects which form the basis of medicine. In addition, laboratories are provided for medical research in Bio-chemistry, Tropical Medicine, Physiology, Pathology, Bacteriology, and Hygiene.

*Hospitals.*—The Clinical School consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of six special hospitals; the Eye and Ear Infirmary, the Hospital for Women, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, St. George's Hospital for Skin Diseases, and Liverpool Maternity Hospital. These hospitals contain in all a total of over 1140 beds.

*Fellowships and Scholarships.*—Fellowships, Scholarships, and prizes of over £1000 are awarded annually. There are also numerous Entrance Scholarships. Particulars may be obtained on application.

*The following Prospectuses may be obtained on application to the Registrar:*—**Medical Faculty, School of Tropical Medicine, School of Dental Surgery, School of Veterinary Science, and Diploma in Public Health.**

**R. E. KELLY, C.B., M.D., B.Sc., F.R.C.S.**

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# UNIVERSITY of ABERDEEN

**Founded 1494.**

## FACULTY OF MEDICINE.

THE Degrees in medicine granted by the University are—Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery. The Degree of Ph.D. is also granted in this Faculty. They are conferred only after Examination, and only on Students of the University. Women are admitted to instruction and graduation on the same footing as men. A Diploma in Public Health is conferred after Examination on Graduates in Medicine of the University of Aberdeen, or of any University whose medical degrees are recognized as qualifying for registration by the General Medical Council of the United Kingdom. The Faculty of Medicine embraces twelve chairs, from which instruction is given in all the main branches of Medical Science.

Practical Classes in connection with these chairs are conducted by the Professors and Assistants in Laboratories furnished with all the necessary appliances; and opportunities are afforded to Students and Graduates to extend their practical knowledge and engage in original research.

Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

Clinical instruction is obtained in the Royal Infirmary, Royal Lunatic Asylum, the Sick Children's Hospital, the City (Fever) Hospital, the General Dispensary, Maternity Hospital and Vaccine Institutions, and the Ophthalmic Institutions.

Bursaries, Scholarships, Fellowships and Prizes, to the number of **50** and of the Annual Value of **£1183**, may be held by Students in this Faculty.

The cost of Matriculation, Class and Hospital Fees for the whole curriculum, inclusive of the fees for the Degrees, is approximately **£236.**

A Prospectus of the Classes, Fees, &c., may be had on application to—

H. J. BUTCHART, *Secretary.*

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# Royal College of Surgeons of Edinburgh

## FOUNDED 1505.

Copies of the Regulations for the Fellowship, Licence, and Licence in Dental Surgery, with dates of Examinations, Curricula, etc., for the year 1923, are now ready, and may be had on application to—

D. L. EADIE, 49 LAURISTON PLACE, EDINBURGH, *Clerk of the College.*

# ST. MUNGO'S COLLEGE, GLASGOW.

## FACULTY OF MEDICINE.

The commodious Medical Buildings of the College are situated within the grounds of the GLASGOW ROYAL INFIRMARY, and in this Hospital, containing (including the OPHTHALMIC DEPARTMENT) over 600 Medical and Surgical beds, the Clinical and Pathology Classes are conducted.

LECTURES AND DEMONSTRATIONS—Elementary Physics—Prof J. T. BROWN, M.A., B.Sc. Chemistry—Prof. ALEC. B. STEPHEN, B.Sc., F.I.C. Botany—Prof. JAMES SWANSON, M.A., M.B. Zoology—Prof HUGH MILLER. Senior Anatomy, Junior Anatomy, Osteology, Practical Anatomy—Prof JAMES BATTERSBY, F.R.C.S Eng. Physiology—Prof ARCH. GALBRAITH FAULDS, M.B., C.M., F.R.F.P.S.,G. Surgery—Prof. MILNE MCINTYRE, M.D., F.R.F.P.S.,G. Clinical Surgery—The SURGEONS, Royal Infirm. Practice of Medicine—Prof. JOHN HENDERSON, M.D. Clinical Medicine—The PHYSICIANS, Royal Infirmary. Midwifery—Prof. ROBERT JARDINE, M.D. Materia Medica—Prof. T. STEWART BARRIE, M.B. Pathology—PATHOLOGIST to the Royal Infirmary. Ophthalmology—Prof. HENRY G. LEASK, M.D., F.R.F.P.S.,G. Gynæcology—Prof. BALFOUR MARSHALL. Psychological Medicine—Prof. JAMES H. MACDONALD. Forensic Medicine, Public Health Laboratory—Prof. A. ALLISON.

The fees for all the Lectures, Practical Classes and Hospital attendance necessary for candidates for the Diplomas of the English or Scotch Colleges of Physicians and Surgeons amount to about £120

A Syllabus of the Medical Curriculum, giving particulars of the classes, fees, etc., may be had gratis on application to the Dean of the Medical Faculty, 86, Castle Street, Glasgow.

# ROYAL DENTAL HOSPITAL OF LONDON.

## SCHOOL OF DENTAL SURGERY (University of London),

Leicester Square, LONDON, W.C.2.

THIS SCHOOL is thoroughly equipped for Teaching Dental Surgery. The CLINIC of the Hospital is UNRIVALLED.

**DENTAL MECHANICS.**—Pupils may join in May and October for the two years' Training in Dental Mechanics.

WOMEN are admitted as Students, and are eligible for all appointments and prizes.

*For further particulars apply* THE DEAN.

# ST. CHAD'S HOSPITAL

## *(FOR PAYING PATIENTS),*

## BIRMINGHAM.

THIS HOSPITAL provides Medical and Surgical Treatment for patients WHOSE MEANS ARE LIMITED. The conditions of admission can be obtained on application to the undersigned.

DAVID J. RICHARDS, *House Governor.*

# ROYAL (DICK) VETERINARY COLLEGE

## EDINBURGH.

PRINCIPAL - O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S.

After attendance on complete courses of instruction in this College, Students may proceed to the Examinations for the Diploma of Membership of the Royal College of Veterinary Surgeons (M.R.C.V.S.).

Students of the College may also present themselves for the Degree of Bachelor of Science (B.Sc.) in Veterinary Science conferred by the University of Edinburgh.

A copy of the College Calendar may be obtained on application to F. P. MILLIGAN, W.S., Sec.

*For Scale of Charges for Advertisements, apply to THE ADVT. MANAGER, The "Medical Annual" (John Wright & Sons Ltd., Bristol).*

# ST. LUKE'S HOSPITAL

ESTABLISHED 1751.

*Private Nursing Staff Department.*

**TRAINED NURSES** for **Mental** and **Nerve Cases** can be had immediately. Apply to Lady Superintendent, 19, Nottingham Place, London, W.1.

*Telephone: Mayfair 5420. Telegraph: "Envoy, Baker, London."*

**Northern Branch.**—Apply, Lady Superintendent, 57, Clarendon Road, Leeds.

*Telephone: Leeds 26165.*

THE

# CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.

Patroness - - - HER MAJESTY THE QUEEN.

This Society, founded in 1894 and incorporated by Royal Charter in June, 1920, was formed for the purpose of affording protection to the profession of Massage and to its registered members:—

- By improving the training and status of masseuses and masseurs.
- By providing and supervising independent examinations.
- By setting up Registers of persons qualified to practise.
- By arranging post-graduate courses, lectures, and conferences.
- By supplying work for members (under Registry regulations) and
- By working in all ways for the advancement and general welfare of the profession.

Registration with the Chartered Society is open to all certificated masseuses and masseurs who fulfil requirements, particulars of which can be obtained on application. The Register contains over 4500 names and addresses of members engaged in private practice or holding appointments under the Admiralty, War Office, Ministry of Pensions, Red Cross Society, or in Hospitals and Institutions. Treatments are carried out under Medical direction only, and members may not advertise except in recognised medical and nursing papers.

All inquiries for Masseuses and Masseurs in London and the Provinces will receive prompt attention on application to the Secretary, C.S.M M.G., 157, Great Portland Street, W.1. Telephone, Langham, 1893.

# Medical Defence Union,

*INCORPORATED 1885.* LIMITED,

Registered Offices: **4 Trafalgar Square, Strand, W.C.2.**

*President*
SIR CHARLES BALLANCE, K.C.M.G., C.B., M.V.O.

*Hon. Treasurer:*
SEYMOUR TAYLOR, M.D., F.R.C.P.

*General Secretary:* JAMES NEAL, M.R.C.S., L.R.C.P.

THE OBJECTS OF THE UNION ARE AS FOLLOWS:

I.—To support and protect the character and interests of Medical Practitioners practising in the United Kingdom.

II.—To promote honourable practice, and to suppress or prosecute unauthorized practitioners.

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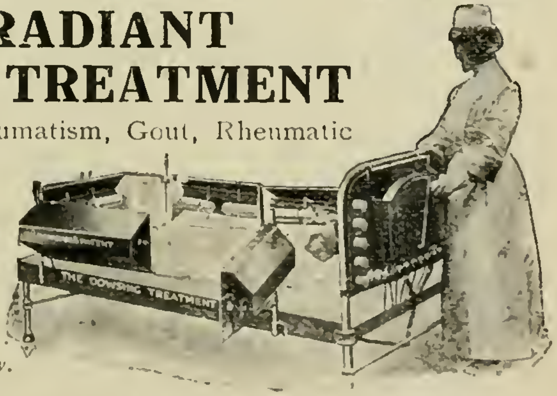

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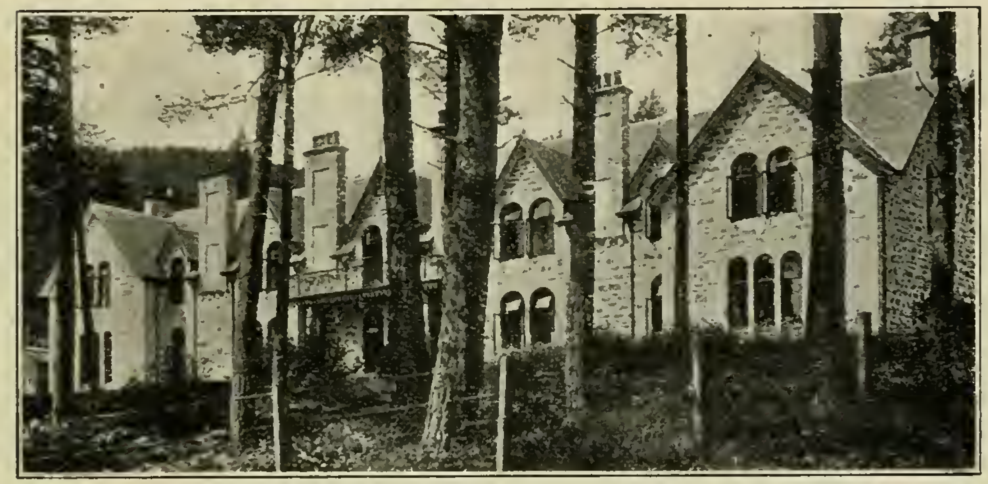
# The GRAMPIAN SANATORIUM

## KINGUSSIE, N.B.



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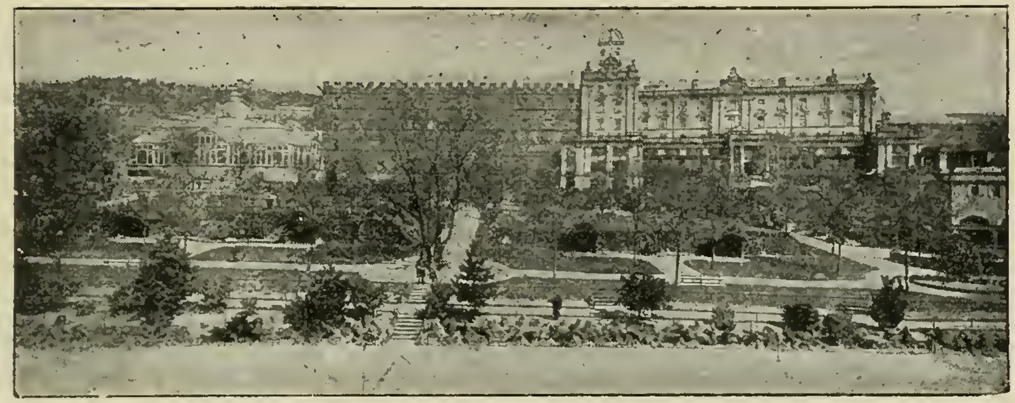

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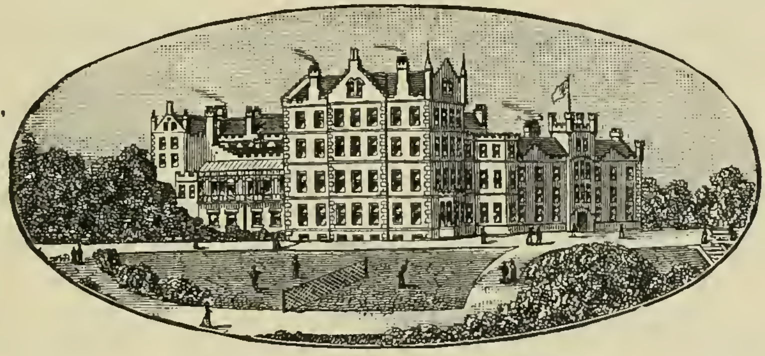

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C. C. WORSTER DROUGHT, M.A., M.D., M.R.C.P.
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Voluntary Boarders received without certificates.

SEASIDE BRANCH AT WORTHING.

*For Terms and other particulars apply to* RESIDENT PHYSICIAN.

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# ST. PATRICK'S HOSPITAL,

**DUBLIN.**

**For the treatment of Nervous and Mental Diseases.**

FOUNDED BY JONATHAN SWIFT, D.D., 1745.

THIS historic Institution, the first of its kind in Ireland, has been completely modernized and considerably enlarged. It affords every facility for the treatment of ladies and gentlemen suffering from nervous and mental diseases.

There are branch establishments situated at St. Edmondsbury, Lucan, within a beautifully wooded demesne of about 400 acres. A portion of the demesne is worked as a home farm, from which daily supplies of milk, mutton, poultry and vegetables, etc., are delivered to the three hospitals by means of a motor van. Extensive gardens and recreation grounds. Frequent drives by horse and motor.

## MEDICAL STAFF.

*Medical Superintendent:* RICHARD R. LEEPER, F.R.C.S.I.
*Assistant Medical Officer:* H. R. C. RUTHERFORD, F.R.C.S.I., D.P.H.
*Visiting Physician:* RICHARD A. HAYES, M.D., F.R.C.P.I.

Rates of maintenance vary according to the nature of each case and the accommodation required.

For forms and further particulars apply to Mr. A. E. Coe, Registrar, St. Patrick's Hospital, James's Street, Dublin; or, in case of urgency, to the Medical Superintendent.

*Telephones:* Dublin 538. Lucan 21.

**St. ANDREW'S HOSPITAL**
**FOR MENTAL DISEASES,**
**NORTHAMPTON.**

*FOR THE UPPER and MIDDLE CLASSES ONLY.*

**President—THE RIGHT HON. THE EARL SPENCER, K.G.**

THIS Registered Hospital is pleasantly situated in 118 acres of park and pleasure grounds. Every facility is provided for cricket, football, hockey, croquet, lawn-tennis, bowls, golf, motoring, boating, and gardening. Voluntary Boarders as well as Certified Patients of both Sexes are received for treatment. PRIVATE ROOMS with Special Attendants, in the Hospital or in Villas in the Grounds, can be arranged.
The Hospital has a BRANCH ESTABLISHMENT at

**MOULTON PARK,**

Two miles from the Hospital, where there is a farm of 517 acres, which supplies the Hospital with meat, milk, and other farm produce.

**BRYN-Y-NEUADD HALL, LLANFAIRFECHAN.**

THE SEASIDE HOUSE OF ST. ANDREW'S HOSPITAL is beautifully situated in a Park of 331 acres, close to the Sea, and in the midst of the finest scenery in North Wales. Patients can enjoy good cricket, lawn-tennis, croquet, golf, trout-fishing, and bathing. Patients or Boarders may visit this Branch for long or short periods, and can have Private Rooms in Villas in the Park.

**For Terms and further particulars apply to the MEDICAL SUPERINTENDENT, ST. ANDREW'S HOSPITAL, NORTHAMPTON. Telephone No. 56.**

**New Saughton Hall,** **POLTON, MIDLOTHIAN.**

**The only Private Hospital for the Treatment of Mental Cases in Scotland.**

**NEW SAUGHTON HALL,** which takes the place of Saughton Hall, established in 1798, is situated seven miles south of Edinburgh, in the beautiful neighbourhood of Hawthornden and Rosslyn, and is surrounded by picturesque and well-timbered pleasure grounds extending to 125 acres. There is a frequent motor bus service from Edinburgh to Loanhead.

Railway Stations.—Polton five minutes; and Loanhead, ten minutes' walk from the Institution—reached in half-an-hour from the Waverley Station, Edinburgh. *Telephone:* 4 *Loanhead.*

Forms of Admission for Voluntary or Certified Cases, full instructions, etc., can be obtained on application to the Resident Medical Supt., **S. RUTHERFORD MACPHAIL, M.D. Edin.**

**Terms from £157 to £525 per annum, according to requirements.**

**THE COPPICE,**

**NOTTINGHAM.**

***Hospital for Mental Diseases.***

President: The Right Hon. EARL MANVERS.

THIS Institution for the reception of **PRIVATE PATIENTS** of both sexes of the **Upper and Middle Classes** only, at moderate rates of payment, is beautifully situated in its own grounds about two miles from Nottingham, and from its singularly healthy and pleasant position, and the comfort of its internal arrangements, affords every facility for the **Relief and Cure of those Mentally Afflicted.** Divine Service is held in the Institution every Sunday by the Chaplain, who also visits the Patients. Carriage and motor exercise is provided.

FOR TERMS, ETC., APPLY TO

DR. HUNTER, *Physician-Superintendent.*

# HOLLOWAY SANATORIUM

## VIRGINIA WATER.

*A Registered Hospital for the CURE and CARE of the INSANE and of NERVOUS INVALIDS — of the MIDDLE and UPPER CLASSES.—*

THIS Institution is situated in a beautiful and healthy locality, within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Boarders not under Certificates can be admitted.

There is a BRANCH ESTABLISHMENT at CANFORD CLIFFS, BOURNEMOUTH, where Patients and Boarders can be sent for a change and provided with all the comforts of a well-appointed home.

*For Terms, apply to the* RESIDENT MEDICAL SUPERINTENDENT,
**St. Ann's Heath, Virginia Water, SURREY.**

# BOREATTON PARK

THIS PRIVATE ASYLUM, which was founded by the late W. H. O. SANKEY, M.D., F.R.C.P., for the reception of a limited number of

**LADIES & GENTLEMEN MENTALLY AFFLICTED,**

—— is now conducted by his son, ——
E. H. O. SANKEY, M.A., M.B., B.C. Cantab.

The Ladies' Division is directly supervised by Mrs. SANKEY.

The Mansion stands high, among handsomely laid out gardens in the midst of a picturesque deer park (about 40 head of deer are kept), and commands a magnificent view of Welsh mountain scenery.

Carriages, horses, motor, lawn-tennis, golf, trout and other fishing are provided.

Arrangements can be made to enable friends of patients to reside in the House as Boarders if so desired.

The Asylum is situate about ten miles from Shrewsbury, within easy distance of Baschurch Station, G.W.R., whither carriages can be sent at any time for visitors.

**Letters and Telegrams should be addressed to—**

**Dr. SANKEY, Boreatton Park, Baschurch, SALOP.**

# The PLEASAUNCE,

## YORK.

**Old Established MENTAL HOME for LADIES.**

*Telephone:* **184 YORK.**

Licensed for 22 Ladies of the Upper & Middle Classes. The House stands in extensive well-wooded Grounds within the boundary of the city.

**A special feature is made of the Treatment of Incipient Mental Cases, Certified or Voluntary.**

*Terms and Prospectus on application to the Licensees—*
LEONARD D. H. BAUGH, M.B.; (Mrs.) JANIE S. BAUGH, M.B.

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# KINGSDOWN HOUSE,

## BOX (Near BATH).

Telephone: No. 2 Box.

LICENSED FOR THE TREATMENT OF DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

THIS House is situate 450 feet above sea level, and commands extensive views of the surrounding country.

Access—Box Station (G.W.R.); Bath Stations (Midland and G.W.R.) twenty minutes from the house.

For terms apply to—
**Dr. H. C. MacBRYAN,** *Resident Proprietor & Medical Superintendent, at the above,*

*Or at* 17, BELMONT, BATH. *Telephone:* No. 636, BATH.

# STRETTON HOUSE,

## CHURCH STRETTON, SHROPSHIRE.

**A Private Licensed House for the treatment of Gentlemen suffering from Nervous or Mental Diseases.**

*ESTABLISHED 1853.*

SITUATED amongst charming scenery, more than 600 feet above the sea, large grounds, pure water, perfect sanitation, and enjoying the bracing air of the "English Highlands."

Easily accessible from all parts. Good train services on G.W. and L. & N.W. Railways.

Congenial occupation and recreation are specially attended to, and all sorts of indoor and outdoor amusements are provided.

Patients have carriage exercise by arrangement, and daily walks amongst the beautiful mountain scenery.

*For Terms and further information, apply to—*

THE MEDICAL SUPERINTENDENT.

Telegrams :
"Stretton House, Church Stretton."

⁂

Telephone :
10, Church Stretton.

# Private MENTAL HOSPITALS.

## CO. DUBLIN.

**HAMPSTEAD, Glasnevin, for Gentlemen | HIGHFIELD, Drumcondra, for Ladies.**

For the Cure and Care of Patients of the Upper Class suffering from Mental and Nervous Diseases and the Abuse of Drugs.

Telephone No. 1032. Telegrams : "Eustace," Glasnevin.

**These Hospitals are built on the Villa System, and there are also Cottages on the demesne (154 acres), which is 150 ft. above the sea level and commands an extensive view of the Dublin Mountains and Bay.**

*Voluntary Patients admitted without Medical Certificates.*

For further information apply for illustrated prospectus, etc., to the Resident Medical Superintendents: Dr. Henry Marcus Eustace, Highfield, Drumcondra, or Dr. William Nielson Eustace, Hampstead, Glasnevin; or at the Office, 41, Grafton Street, Dublin. *Telephone* 198. On Mondays, Wednesdays, and Fridays, at 2.30 p.m.

# CORPORATION MENTAL HOSPITAL,

## PORTSMOUTH.

Accommodation is provided for Ladies and Gentlemen in Two Detached Villas, at a charge from **2½ guineas** upwards, including all necessaries except clothing.

*APPLY - MEDICAL SUPERINTENDENT.*

# THE WARNEFORD

## HEADINGTON HILL, OXFORD.

**A Registered Hospital for the Care & Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders. . .**

*President*—THE RIGHT HON. THE EARL OF JERSEY.
*Chairman of the Committee*—REV. WM. ARCHIBALD SPOONER, D.D.,
Warden of New College, Oxford.
*Vice-Chairman*—
SURGEON-GENERAL SIR A. FREDERICK BRADSHAW, K.C.B.

THIS HOSPITAL is pleasantly situated on Headington Hill, on the outskirts of the City of Oxford. The grounds, which extend to over 70 acres, command extensive views of the surrounding country.

The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

**VOLUNTARY BOARDERS ARE RECEIVED.**

*For terms and further particulars, apply to the*—
**Physician Superintendent, ALEX. W. NEILL, M.D.**

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# CHEADLE ROYAL,

## CHEADLE, CHESHIRE.

THIS Hospital for **MENTAL DISEASES** with its Seaside Branch GLAN-Y-DON, COLWYN BAY, is for the TREATMENT of PRIVATE PATIENTS of the UPPER and MIDDLE CLASSES. :: Voluntary Boarders received.

For Terms, etc., apply to the SUPERINTENDENT - **J. A. C. ROY, M.B.,** or he may be seen at 72, BRIDGE STREET, MANCHESTER, on Tuesdays and Fridays, from 2.0 to 3.0. *Telephone:* **208 Cheadle Hulme.**

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# The Lawn, Lincoln.

A REGISTERED HOSPITAL for MENTAL DISEASES,
situated in the City of Lincoln, near to the Cathedral.

*FOR TERMS, APPLY TO—*

DR. RUSSELL, *Resident Medical Superintendent.*

# *Brislington House,*

## *Near BRISTOL.*

**Established 1804.**

A **PRIVATE MENTAL HOSPITAL** for the care and treatment of persons of the upper and middle classes of both sexes.

The House is situated on an estate of 200 acres and has extensive pleasure grounds and a Farm connected with it. It lies between Bristol and Bath, 3 miles from Bristol Station, and within 2½ hours' journey from London.

In addition to the main building there are several villas, completely detached and pleasantly situated in their own grounds, where there is accommodation for suitable cases. Patients can be received without certificates as Voluntary Boarders.

For terms and further particulars apply to
THE MEDICAL SUPERINTENDENT.

*Telegrams: "Fox, Brislington."* *Telephone: No. 2 Brislington.*

*For the Treatment of Mental Diseases.*

# Shaftesbury House,

## FORMBY-BY-THE-SEA.

Telephone: No. 8 FORMBY. *Near LIVERPOOL.*

THIS HOUSE, specially built and licensed for the **Care and Treatment of a limited number of Ladies and Gentlemen MENTALLY AFFLICTED,** is delightfully situated near the coast between Liverpool and Southport, so that patients have the benefit of pure bracing sea air, for which Formby is noted. The House is in the country, and stands in several acres of ornamental well-wooded grounds, the surroundings being in every way bright, cheerful and pleasant. All kinds of outdoor and indoor amusements and occupation provided. Voluntary Boarders without certificates admitted.

*TERMS MODERATE—Apply DR. STANLEY GILL, Medical Superintendent.*

# BARNSLEY HALL,

## BROMSGROVE, WORCESTERSHIRE.

PRIVATE Mental Patients of both sexes are received in connection with the Worcestershire Mental Hospital. Extensive private grounds in the beautiful Lickey District. **Terms, 35s. WEEKLY.**

*For further particulars and necessary forms apply to the* **Medical Superintendent.**

## DERBY MENTAL HOSPITAL.

### ALBANY HOUSE, a Detached Block for FEMALE PRIVATE PATIENTS.

TERMS: 2 GUINEAS PER WEEK and upwards. This includes everything except clothing. This Villa is distinct from the main building, and has separate recreation grounds.

*For further particulars, apply to the Medical Superintendent,*

**DR. JOHN BAIN, Rowditch, DERBY.**

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## THE GRANGE, Near Rotherham

A SANATORIUM OF THE HIGHEST CLASS FOR THE

### CARE & CURE OF MENTAL INVALIDS (Ladies).

Consulting Physician: CROCHLEY CLAPHAM. M.D., F.R.C.P.E.
Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.
*Physician for Mental Diseases to the Sheffield Royal Hospital.*

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on own personal application. The Rev. R. T. C. SLADE, Mus. Bac., Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

**The Resident Physician may be seen at the Grange; or at Leavygreave House, Hounsfield Road, Sheffield, by appointment. (Nat. Tel. No. 34, Rotherham.)**

*GRANGE LANE STATION (M. S. & L. Railway) is within a quarter of a mile of the Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham changing at Tinsley.*

For TERMS, FORMS, &c., APPLY TO THE RESIDENT PHYSICIAN

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## THE RETREAT, YORK.

### A Registered Hospital for the Treatment of MENTAL DISEASES.

*ESTABLISHED 1792.* *Telephone: 112 York.*

Under the management of a Committee of Members of the Society of Friends. Situated about two miles from York Station. The Patients are derived from the **Upper and Middle Classes,** and none are paupers or rate-aided. **Terms from £6 6s. weekly.**

Voluntary Boarders are received on their own application.

For further particulars see the Annual Report, which will be sent on application to **Dr. HENRY YELLOWLEES, the Medical Superintendent.**

## RETREAT TRAINED NURSES DEPARTMENT.

Staffed by Nurses who have been trained for four years in the Retreat, and conducted upon a profit-sharing basis. MENTAL & NERVOUS CASES only undertaken.

TRAINED FEMALE NURSES, £4 4s. Weekly.

Apply MATRON, Retreat, YORK. *Tel. 112.*

BAILBROOK HOUSE, BATH.

For the Care and Treatment of
Ladies & Gentlemen suffering from
:: Nervous or Mental Breakdown.

Special Attention is given to the Curative Treatment of Early Cases.

*Resident Physician:* DR. NORMAN LAVERS.

*Telephone:* 49 BATH.

VOLUNTARY PATIENTS RECEIVED.

Trams to Bathford pass the entrance gates of Bailbrook House.

Terms Inclusive, from 5 Guineas per week.

SPRINGFIELD HOUSE

NEAR BEDFORD.

(TELEPHONE No. 17.)

A PRIVATE MENTAL HOSPITAL.

ORDINARY TERMS: FIVE GUINEAS WEEKLY.

*Physicians* { DAVID BOWER.
CEDRIC W. BOWER.

Incorporated by Royal Charter.

JAMES MURRAY'S ROYAL MENTAL HOSPITAL, PERTH.

Chairman—The Rt. Hon. The Earl of Mansfield.

THIS **Mental Hospital** is healthily situated, amidst picturesque surroundings, on the Hill of Kinnoull in the immediate vicinity of Perth. It stands in the midst of extensive Pleasure Grounds, surrounded by the fields of the Home Farm, and commands unrivalled views extending over the valley of the Tay to the range of the Grampians. The central position of Perth and the efficient railway service make it easily accessible from all parts.

The beautifully situated mansion-house of **Pitcullen**, adjoining but distinctly separated from the Asylum, is in use as a Convalescent home, and also for Patients afflicted with the milder forms of mental disorder. In addition to this, there are detached **Villas** for those Ladies and Gentlemen who pay the higher boards.

**Seven Gables, Elie**, the seaside house, is arranged as a Holiday Home for the reception of those suffering from mild mental disturbance, and convalescents.

The Institution receives no rate-paid patients. The entire arrangements are of a domestic character, and there are ample means of occupation and amusement.

The Rates of Board vary, according to the requirements and circumstances of each case, from £90 to £500 and upwards, per annum.

**Postal and Telegraphic Address: Dr. CHAMBERS, Perth.** **Telephone: Perth 104.**

# ASHWOOD HOUSE,

## KINGSWINFORD, STAFFORDSHIRE.

**An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.**

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS vary according to requirements as to accommodation, special attendance, etc.

TELEPHONE: 19, KINGSWINFORD.

Railway Stations: Stourbridge Junction (G.W.R.), 3½ miles; Dudley (L. & N.W.R.), 4 miles; Wolverhampton (G.W.R. or L. & N.W.R.), 7 miles.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

# NORTHWOODS HOUSE,

## WINTERBOURNE, near BRISTOL.

**A Sanatorium for Ladies and Gentlemen suffering from Nervous and Mental Disorders.**

SITUATED in a large Park, 300 feet above sea level, in a healthy and picturesque locality, easily accessible from London, Bristol, and Cardiff by Winterbourne Station; or from Fishponds, Yate, or Patchway Stations.

**Voluntary Boarders received without Certificates.**

For further information, see London Medical Directory, p. 2131, and for Terms, etc., apply to—

**DR. J. D. THOMAS, Resident Medical Proprietor, NORTHWOODS HOUSE.**

TELEPHONE - No 18 WINTERBOURNE.

# Bucks Mental Hospital

THE COMMITTEE OF VISITORS are prepared to receive

**PRIVATE PATIENTS on Moderate Terms.**

Separate accommodation is provided for Private Patients on the Male and Female sides of the Institution. The Hospital is situated in the Country, three miles from Aylesbury Station, and about forty miles from London.

*For further particulars apply to the MEDICAL SUPERINTENDENT—*

**DR. H. KERR, STONE, AYLESBURY.**

# BARNWOOD HOUSE,

## GLOUCESTER.

A REGISTERED HOSPITAL for MENTAL DISEASES, for PRIVATE PATIENTS Only, of the UPPER and MIDDLE CLASSES.

ARRANGED and furnished with all the most approved appliances for the treatment, comfort and amusement of the Inmates. Within two miles of the Railway Station, and easily accessible by Rail from London and all parts of the Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of 250 acres. Voluntary Boarders not under certificates are admitted. The MANOR HOUSE for Ladies only, which is entirely separate from the Hospital and standing in its own grounds, is being utilized exclusively for voluntary patients.

*For Terms, etc., apply to* ARTHUR TOWNSEND, M.D.,
**Telephone: No. 7 BARNWOOD.** *Resident Superintendent.*

# PLYMPTON HOUSE,

## PLYMPTON, SOUTH DEVON.

*ESTABLISHED 1834.*

PLYMPTON HOUSE is licensed for the accommodation of both sexes, and is well adapted by its position and appointments for the **Medical Treatment and Care of Patients of the Upper and Middle Classes, suffering from MENTAL DISEASE.**

The Proprietors, Dr. ALFRED TURNER and Dr. J. C. NIXON, have had very large experience of Mental cases, both in public and private institutions, and everything that can be done to ameliorate the condition of the chronic, and promote the cure of the acute cases—placed under their charge—is guaranteed.

*TERMS ON APPLICATION.* *Letters and Telegrams:*
Telephone: No. 2 PLYMPTON. DR. TURNER, PLYMPTON.

# Newlands House

TOOTING BEC COMMON,
LONDON, S.W. 17.

## *Private Mental Hospital*

*FOR LADIES & GENTLEMEN.*

**Telephone:**
**STREATHAM 524.**

THE
# MENTAL HOSPITAL

## DIGBYS, near EXETER.

The above Hospital, situated in healthy country, three miles from Exeter, RECEIVES PRIVATE PATIENTS OF BOTH SEXES.

**FEES from £2 per week.**

*Particulars on application to the*
MEDICAL SUPERINTENDENT.

# FIDDINGTON HOUSE,

## MARKET LAVINGTON, WILTS.

**Telephone: Lavington 11.** **Telegrams: "Benson, Market Lavington."**

THIS OLD-ESTABLISHED HOME for the Care and Treatment of

**LADIES and GENTLEMEN MENTALLY AFFLICTED**

is pleasantly and healthily situated, and stands in over fifteen acres of Pleasure Grounds, Gardens, etc. Every indoor and outdoor amusement provided for the Patients, including Billiards, Cycling, Carriage and Motor Exercise. Tennis, Croquet, etc. Voluntary Boarders received without Certificates. *Railway Stations:* Lavington, G.W.R., 1½ miles; Devizes, G.W.R., 6 miles.

*For Terms, etc., apply to the* **MEDICAL SUPERINTENDENT.**

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# LAVERSTOCK HOUSE

## Near SALISBURY.

*A Private Home for the Care and Treatment of Mental Disorders.*

VOLUNTARY BOARDERS RECEIVED WITHOUT CERTIFICATES.

*For terms and particulars apply to* MEDICAL SUPERINTENDENT.

Telegrams: Benson, Laverstock. 'Phone: 12 Salisbury.

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# The SILVER BIRCHES, Church Street, EPSOM.

**This Home has been established over 60 years for the Care and Treatment of Ladies suffering from Mental Ailments.**

*TERMS, etc., on application to—*

Miss M. O. DANIEL, *Res. Licensee*, or to Dr. E. C. DANIEL, *Co-Licensee.*

Telephone: 346 P.O. Epsom.

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# WYE HOUSE ASYLUM,

## BUXTON, DERBYSHIRE.

*Telegrams—* 130 BUXTON. *Telephone—* BUXTON 130.

It is situated on an eminence commanding extensive views of the surrounding country. The House is heated throughout by means of hot-water apparatus and open fireplaces. Buxton is situated on the mountain limestone formation, 1,000 feet above sea level. The climate is wonderfully bracing, and its reputation as an inland watering place for invalids is undoubted.

*Terms and Particulars of Wye House can be obtained on application to the Medical Superintendent - - - W. W. HORTON, M.D.*

# LONDON COUNTY MENTAL HOSPITAL,

## Claybury, Woodford Bridge, Essex.

***Private Patients.*** Special accommodation for Male Paying Patients is provided at "The Hall", adjoining this Mental Hospital.

***Terms:*** Exclusive of clothing and special luxuries, for Patients having a legal settlement in the County of London, ***56s.*** a week; for others ***63s.*** a week.

Full particulars can be obtained on application to the Chief Officer, Mental Hospitals Department, London County Council, The County Hall, Westminster Bridge, S.E.1.

*All applications will be considered in the order in which they are received.*

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**Established 1826.**

# PECKHAM HOUSE,

## 112, PECKHAM ROAD, LONDON, S.E.

*Telegrams:* **"Alleviated, London."** *Telephone:* **New Cross 576.**

AN Institution licensed for the **CARE and TREATMENT of the MENTALLY AFFLICTED of both Sexes.** Conveniently situated. Electric trams and omnibuses from the Bridges and West End pass the House. Private houses with electric light for suitable cases adjoining the Institution. Holiday Parties sent to the Seaside branch at Worthing during Summer months.

Moderate Terms:—

Apply to MEDICAL SUPERINTENDENT for further particulars.

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# ST. GEORGE'S RETREAT

## BURGESS HILL, SUSSEX.

This Private Asylum is under the management of a community of Augustinian Nuns. It receives Lady Patients only, who are under the immediate care of the Sisters, and are visited regularly by a physician of special experience. The establishment is supplied with every requisite for the treatment and well-being of the patients; and the grounds (280 acres) afford ample space for their recreation and exercise. Also Separate Establishment for the Feeble Minded. It is within two miles of Burgess Hill Station, on the London and Brighton Railway, and is easily accessible from all parts of the kingdom.

*For particulars and terms apply to—*

THE REV. MOTHER SUPERIOR, ST. GEORGE'S RETREAT.

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# West Sussex County Mental Hospital,

## GRAYLINGWELL, CHICHESTER.

PRIVATE PATIENTS are received at low rates of maintenance from £1 15 0 per week

*Particulars supplied on application to the*

MEDICAL SUPERINTENDENT, Graylingwell Hospital, Chichester.

# THE MOAT HOUSE, TAMWORTH, STAFFS.

STATIONS: L. & N.-WEST. and MID. RAILWAYS.

## A HOME for NERVOUS & MENTAL CASES.

The House stands in grounds of 10 acres (within 5 minutes' drive of either Station) and is devoted to the Care and Treatment of a few Ladies suffering from Nervous and Mental Disorders, who enjoy the comforts, privacy, and occupations of home-life. Voluntary Patients are received without Certificates.

For Terms, etc., apply to the Licensees, CLAUDE HOLLINS, or MRS. S. A. MICHAUX (Resident); or to the MEDICAL ATTENDANT, DR. LOWSON.

*Telephone .. **108** Tamworth.*

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# CLARENCE LODGE,

## CLARENCE ROAD, CLAPHAM PARK.

A LIMITED number of **LADIES** suffering from **MENTAL** and **NERVOUS DISORDERS** are received for treatment under a Specialist. The House stands in large grounds.

*For further Particulars see Illustrated Prospectus from the Proprietress,*

**Telephone: 494 Brixton.** MRS. THWAITES.

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# OTTO HOUSE,

## 47, North End Road, WEST KENSINGTON, W.14.

*Telephone:* Hammersmith 1004.

A HOME FOR THE CARE AND TREATMENT OF LADIES MENTALLY AFFLICTED.

Apply to MISS BRODIE (Resident Lady Superintendent).
MRS. SUTHERLAND (Licensed Proprietress).

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# EAST SUSSEX COUNTY MENTAL HOSPITAL.

Accommodation is provided for Private Patients. The Estate comprises 400 acres, and is situated on high ground nine miles north of Eastbourne, and four miles west of Pevensey Bay. There is a separate detached block for children. For particulars apply to

**The Resident Physician and Medical Supt., The Hospital, HELLINGLY.**

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# RESIDENTIAL SCHOOL for Blind, Delicate, and Backward Children.

THEY are thoroughly well cared for and Trained by Educational Specialist in methods employed in the Teaching of the Blind. Special Department for Children suffering from *partial blindness or defective sight.* Pupils taught by special methods and with special apparatus by means of which children are taught to make the *best use of and to economise the limited vision they possess.* The School is situated in beautiful locality, and has a nice garden: is near to the sea and within easy reach of beautiful country. This School holds Board of Education's Certificate for efficiency, and is the only one of its kind in the kingdom.

*The Secretary,* **Brooklands, Upper Maze Hill, ST. LEONARDS-ON-SEA.**

*The All British*

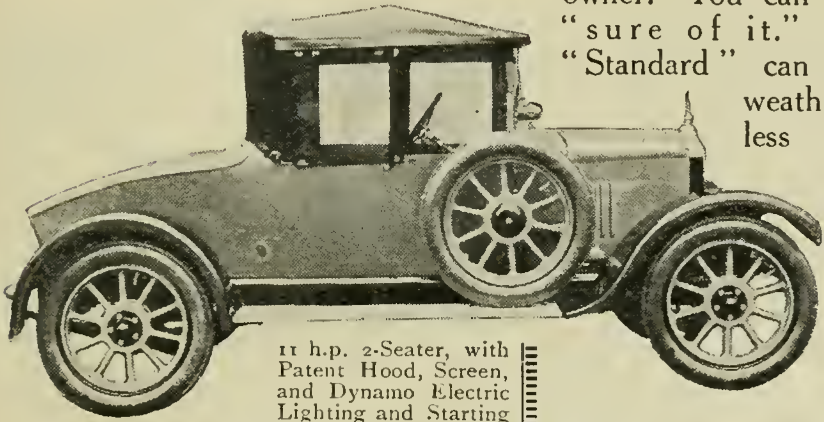
**Standard**

**Light 2 & 4 Seaters: 11 & 8 h.p.**

*Count them on the Road.*

**ALWAYS READY, ALWAYS RELIABLE**

YOU want a car that is reliable, comfortable, and economical. A "Standard" Light Car is always ready for service and requires a minimum of attention. It involves no anxiety on the part of the owner. You can always be "sure of it." Further a "Standard" can be made weatherproof in less than two minutes.



11 h.p. 2-Seater, with Patent Hood, Screen, and Dynamo Electric Lighting and Starting Set .. .. £450

*Send for particulars.*

The Standard Motor Co., Ltd. Coventry.

London Showrooms:
49, Pall Mall S.W. 1.

*BEFORE PLACING THAT ORDER for a*

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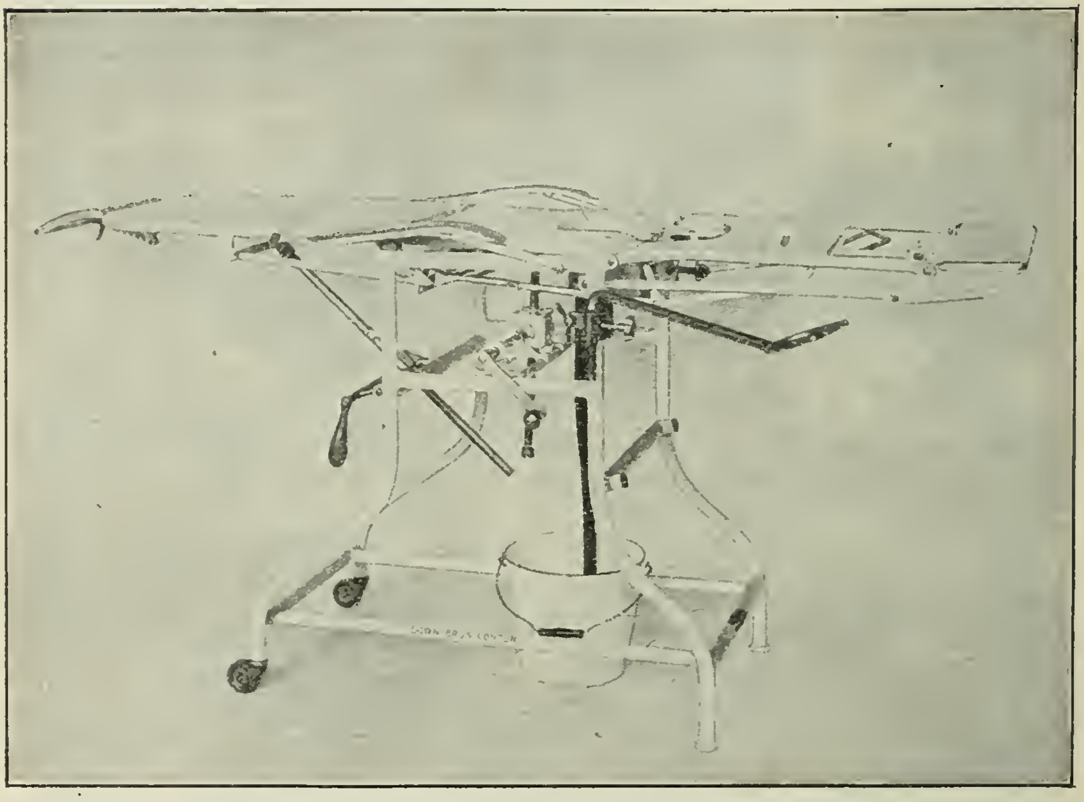

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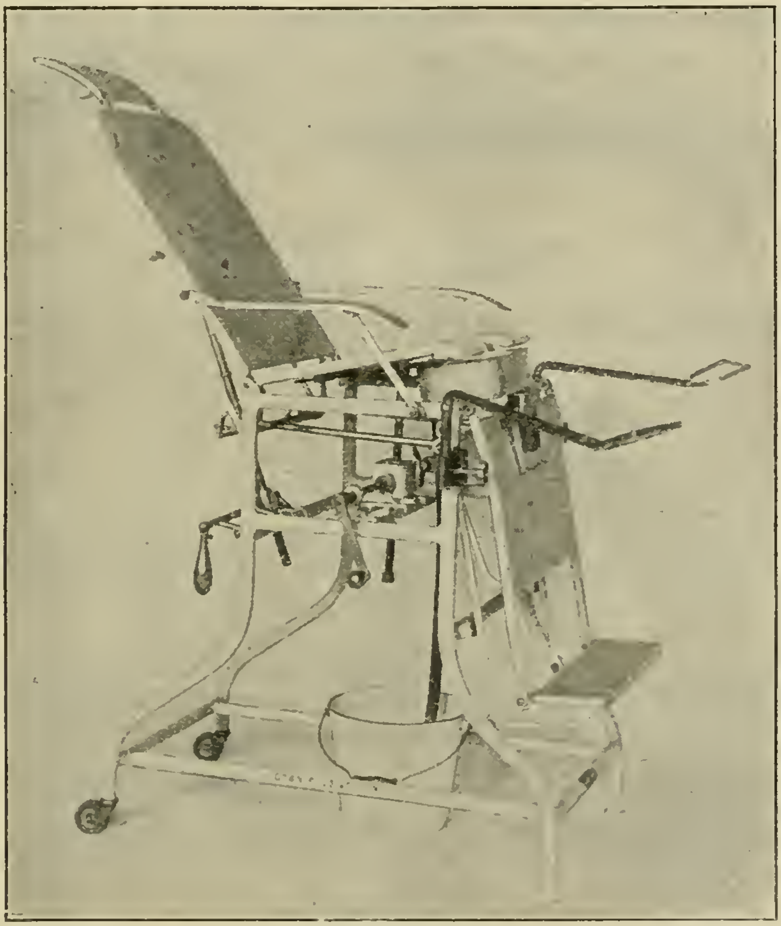

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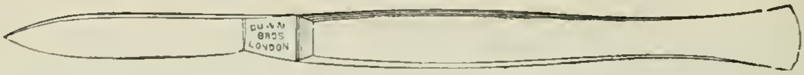

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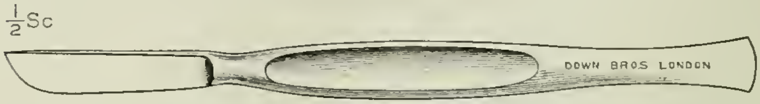

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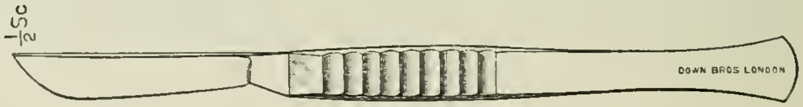

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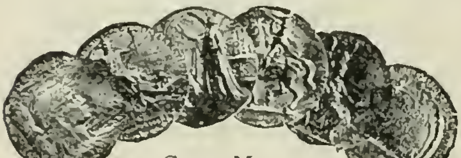

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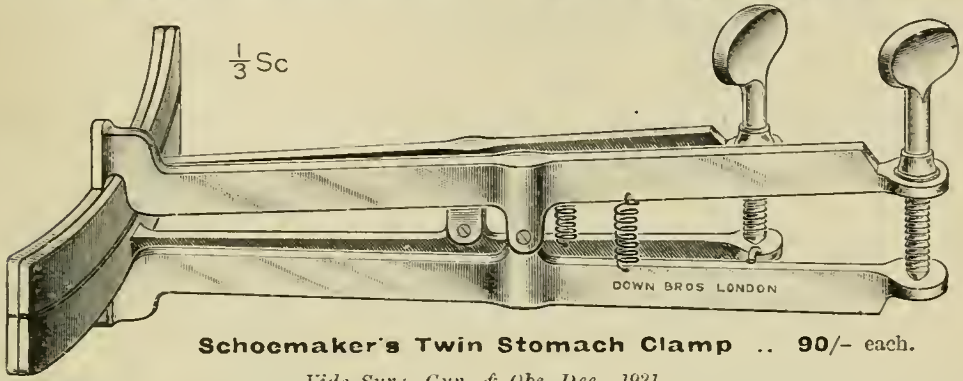

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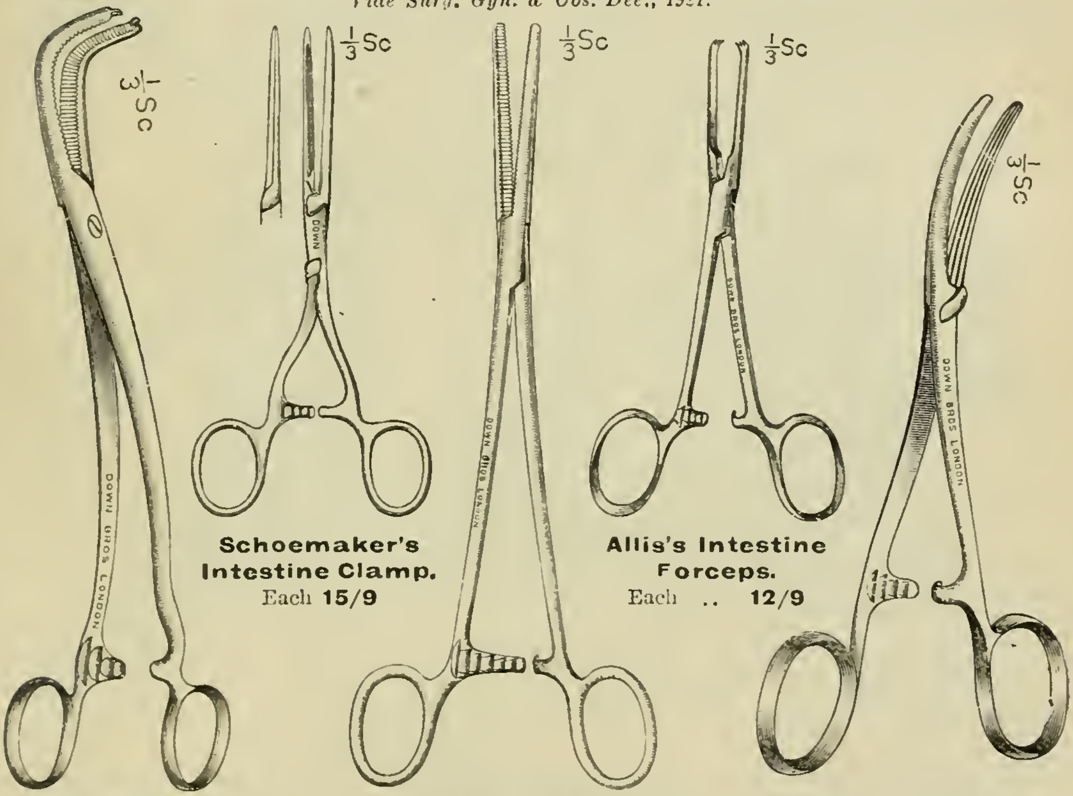

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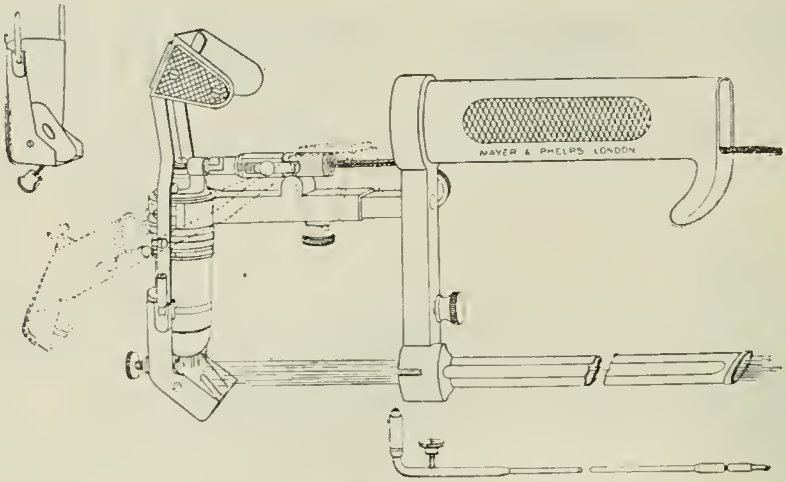

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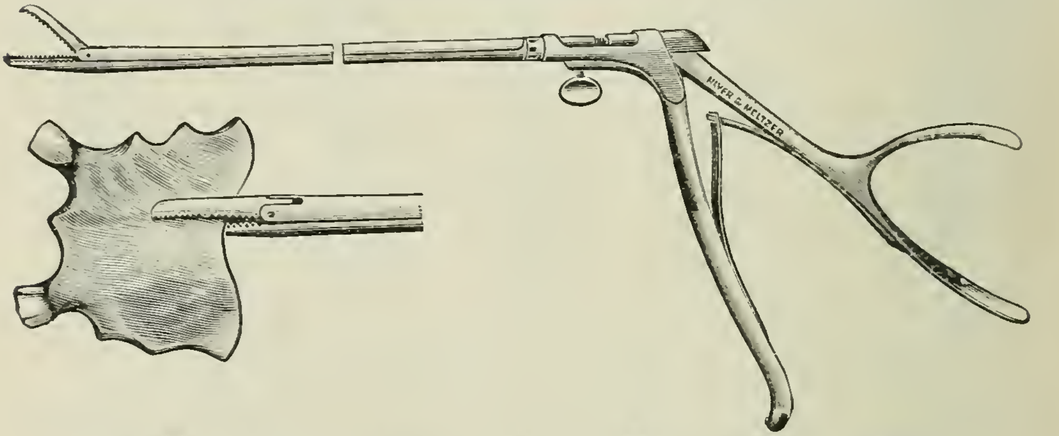

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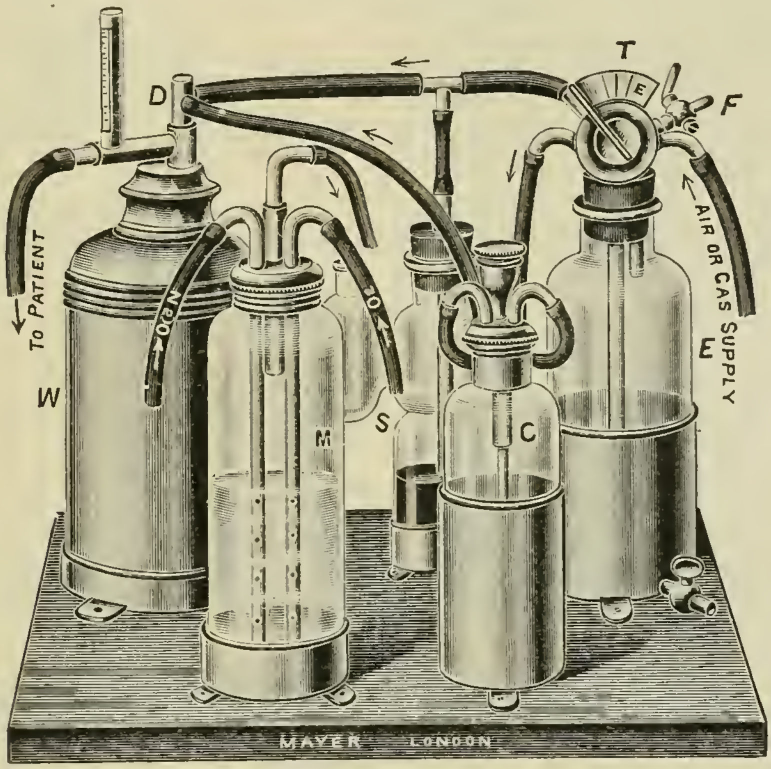

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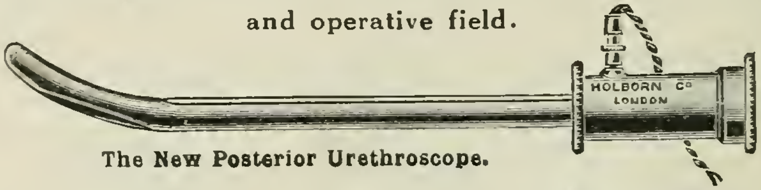

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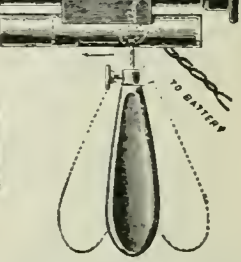

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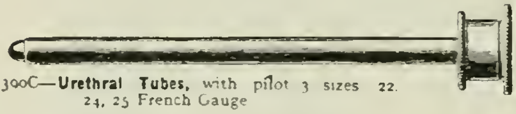

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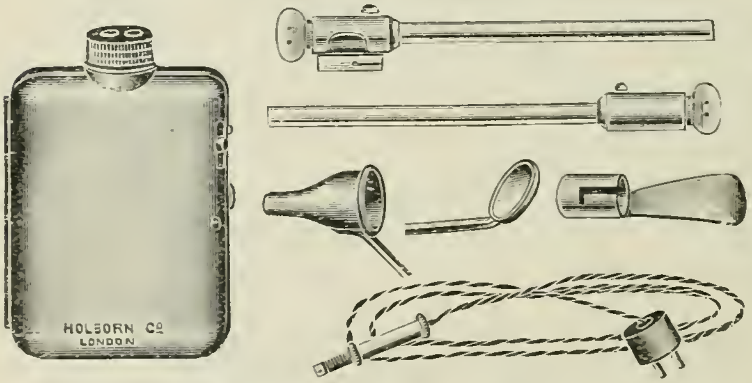

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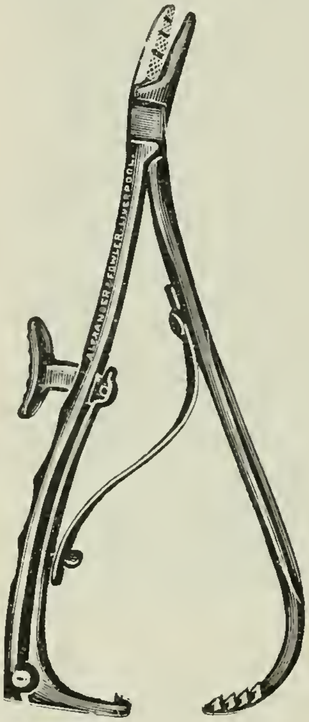
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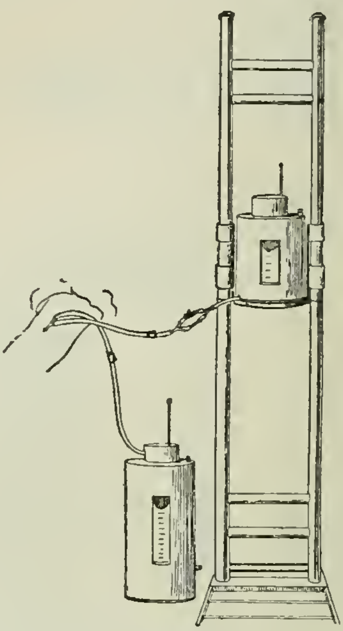

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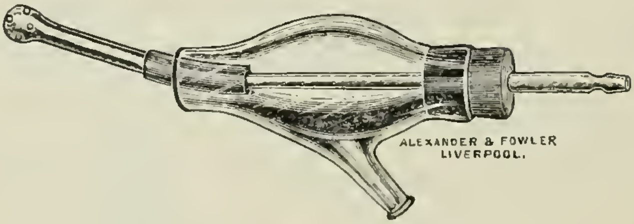

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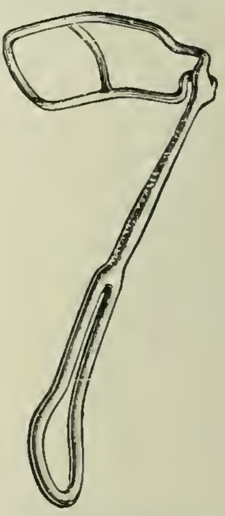

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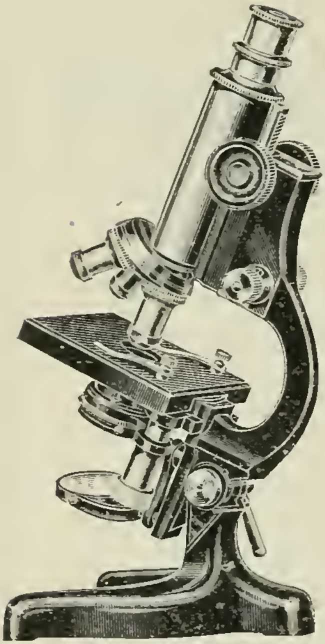

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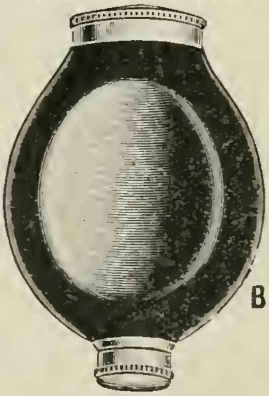

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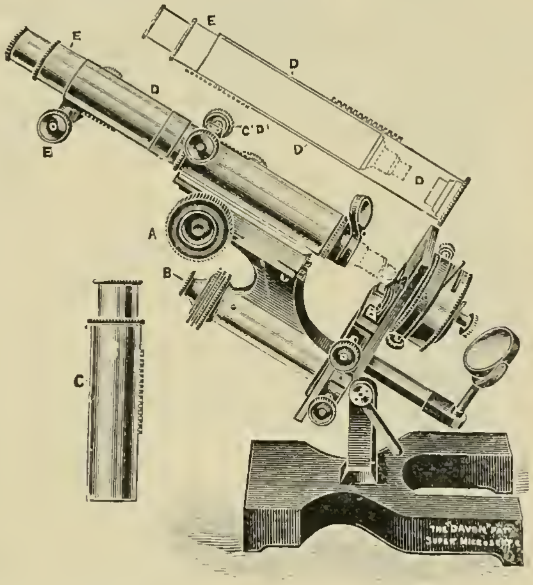

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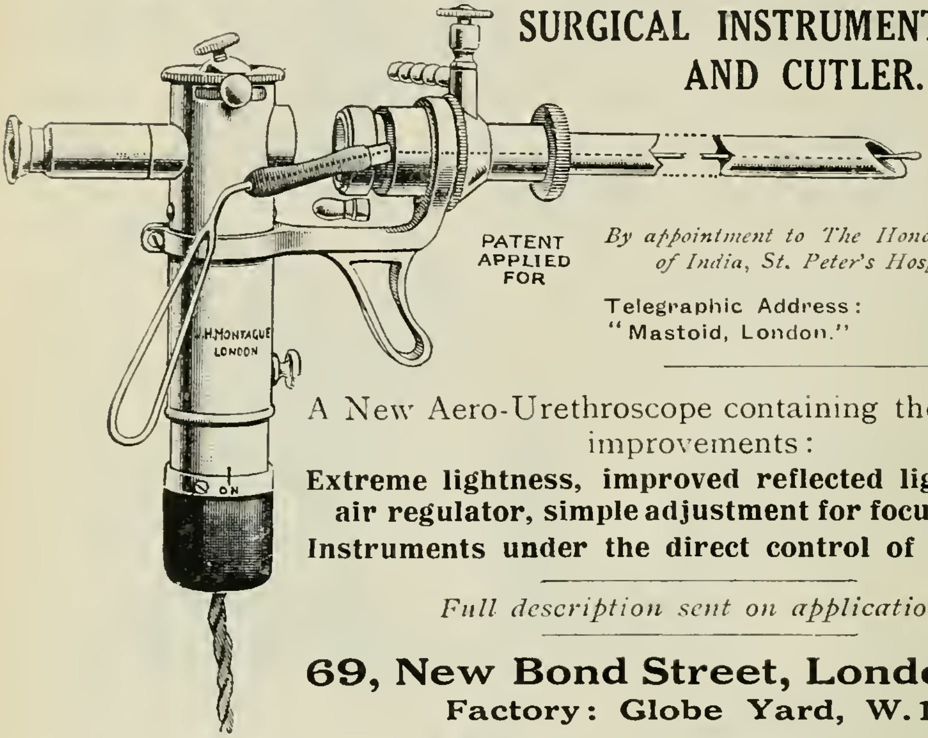

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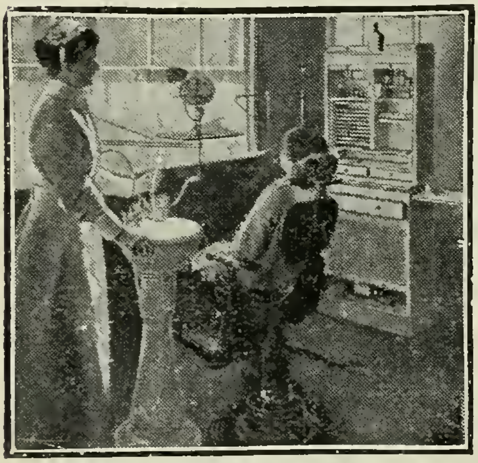

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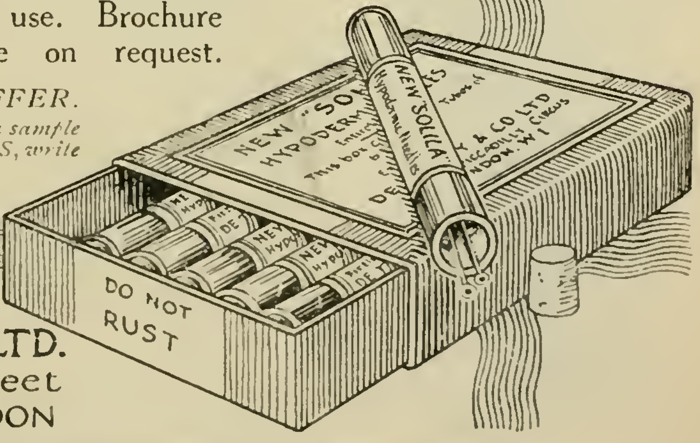

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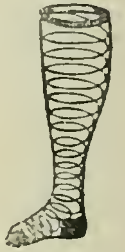

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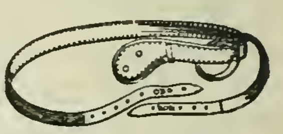

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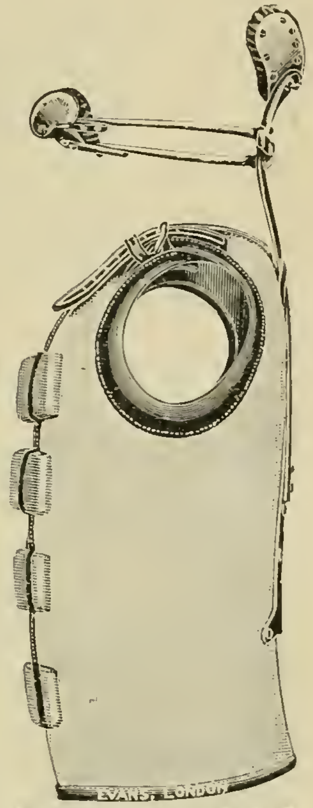

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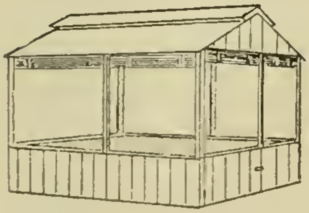

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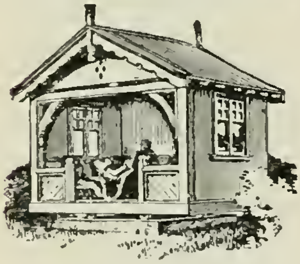

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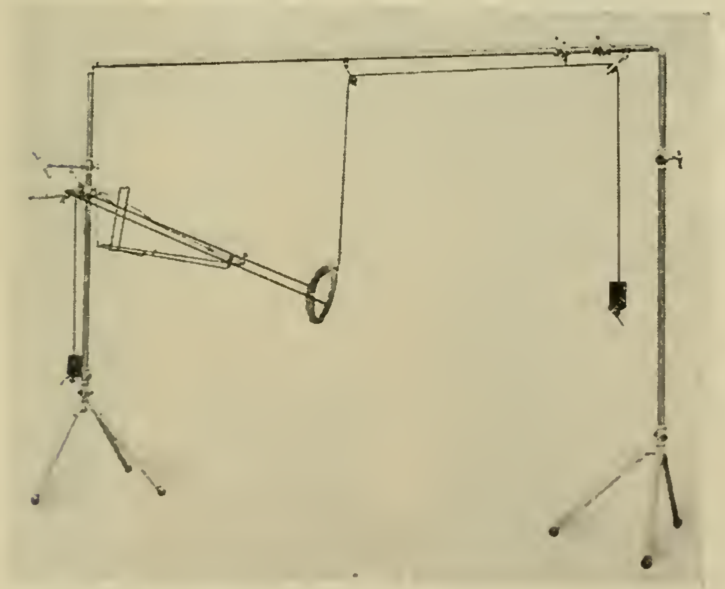

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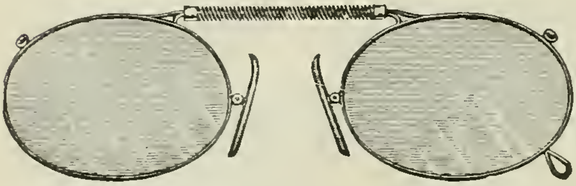

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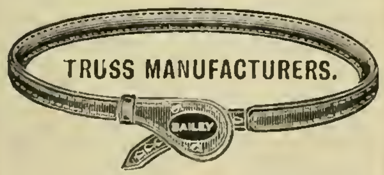

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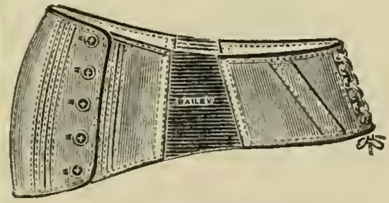

Fig. 9b.—BELT.
For application in recumbent position.

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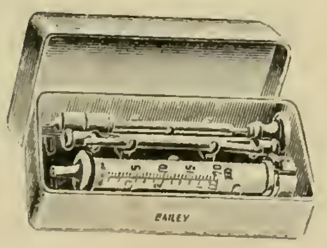

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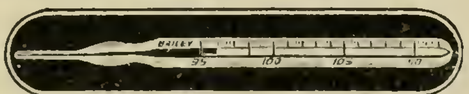

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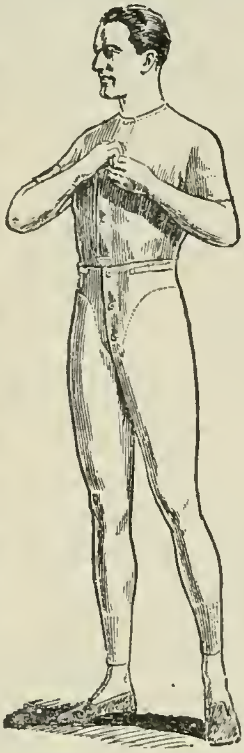

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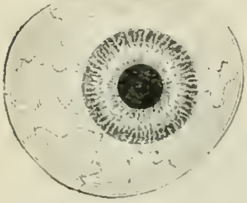

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| ,, Caryoph. Conc., I to 7 | ,, | 2/– | ,, Senegæ Conc., I to 7 | ,, | 3/8 |
| ,, Cascarilla Conc., I to 7 | ,, | 2/6 | ,, Valerian Conc., 1 to 7 | ,, | 2/2 |
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| ,, Bellad. Meth. | 5 lb. | 3/3 | ,, Tereb. Acet., B.P. | 5 lb. | 2/2 |
| | 1 lb. | 3/7 | | | |

| | At per lb. | | | At per lb. | |
|---|---|---|---|---|---|
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| | 1 lb. | 1/5 | ,, Morphinæ Acet. or Hydrochlor. B.P. | 6 lb. | 3/9 |
| ,, Ammon. Aromat. | 6 lb. | 1/– | ,, Opii Sed. | 5 lb. | 5/– |
| ,, Arsenicalis, B.P. | 7 lb. | –/6½ | ,, Plumbi Subacet., B.P. | 7 lb. | –/9 |
| | 1 lb. | –/11 | ,, Pruni Virg. p.s. 1 to 7 | 5 lb. | 4/3 |
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| | B.P. | Aquos. | | B.P. | Aquos. |
|---|---|---|---|---|---|
| Tinct. Belladon. | 4/6 | 2/– | Tinct. Hyoscyam. | 5/– | 2/4 |
| ,, Benzoin | 5/3 | — | ,, Nucis Vom. | 4/3 | 1/4 |
| ,, Camph. Co. | 3/4 | 1/6 | ,, Opii | 4/– | 3/– |
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| Bismuth Carb. | 3 lb. | 14/4 | | 1 lb. | 6/1 |
| Chloform. Pur. | 8 lb. | 3/10 | Syr. Cascara Aromat., B.P. | 6 lb. | 2/10 |
| | 6 lb. | 4/5 | Syr. Glycero-Phosp. Co. | 6 lb. | 2/4 |
| Ext. Ergot Liq., P.B. | 1 lb. | 7/– | Ung. Acid. Boric. Flav. | 28 lb. pail | –/8 |
| Ferri. Ammon. Cit. | 7 lb. | 3/3 | ,, ,, ,, Alb., B.P. | 28 lb. | 1/1 |
| Glycerine, Pure | 7 lb. | 1/2 | ,, Hydrarg. B.P... | 7 lb. | 2/8 |
| Hexamine | 1 lb. | 4/10 | | 1 lb. | 3/– |
| Iodoform Pulv. | 1 lb. | 24/6 | ,, ,, Ammon. | 7 lb. | 2/3 |
| Oxymel. Scillæ, P.B. | 7 lb. | –/10 | ,, Ichthamollis, B.P.C. | 7 lb. | 2/2 |
| Pot. Bicarb. | 7 lb. | –/10 | ,, Zinci Ox. | 28 lb. | 1/1 |
| Potass. Bromid., B.P. | 2 lb. | 1/2 | Vin. Ipecac., B.P. | 5 lb. | 2/11 |
| ,, Iodid., B.P. | 3 lb. | 17/6 | | | |
| Sod. Salicyl. Pulv., B.P. | 2 lb. | 2/6 | | | |
| Sod. Sulphas Feathery cryst | 7 lb. | –/3 | | | |
| Sp. Ammon. Aromat., B.P. | 5 lb. | 4/2 | | | |

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